

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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SCE&G is 1985 Utility of the Year

BARRINGTON, IL—South Carolina Electric & Gas Co. has been selected as the 1985 Electric Utility of the Year by *Electric Light & Power*. Announcement of the company's selection to be the 17th recipient of the annual award was made by Robert A. Lincicome, *EL&P* Editor-in-Chief.

Lincicome said the utility was chosen for the award because of its strong performances on behalf of its shareholders, customers and employees and for exemplary corporate citizenship in its service area.

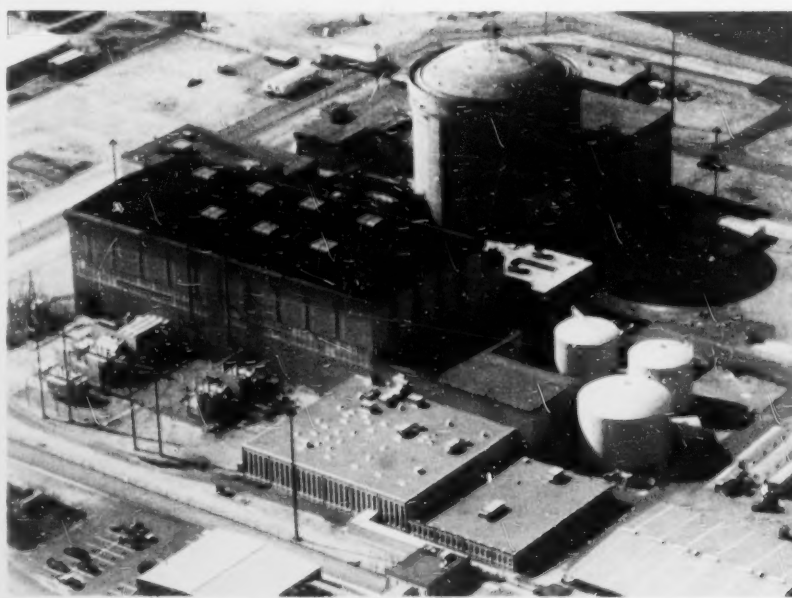
A profile of SCE&G begins on page 11

Specifically, SCE&G was selected for a combination of unusually strong performances. The utility completed its V.C. Summer nuclear plant and was able to get it into the rate base in 1984. It formed a holding company, Seana Corporation, to provide an umbrella organization to facilitate growth through diversification. It formed a subsidiary to take ownership of its Williams station, enabling it to convert the plant to burn coal, qualify for FERC regulation and save customers interest costs amounting to \$6-million. It has completed a 129-mile fiber-optic system, the longest in the industry by a substantial margin,

with "private carrier" status to allow excess capacity to be sold to outside customers. It is heavily involved in community service activities and has improved customer perceptions of the company over the past two years. The company has received high marks on its commission-mandated management audit for the efficiency of its operations and has been recognized for its productivity improvements.

To top it all off, the company improved its 1984 earnings performance by 33-percent after a strong performance in 1983. Per-share earnings rose to \$3.05 and their quality was strengthened because AFUDC was reduced to only about 12 percent. Moreover, its stock rose to 122 percent of book value at year-end and to 140-percent of book last June 30.

An additional strong factor in the company's selection was its broad range of customer assistance and development programs, including weatherization of needy customers' homes, business/industry training of disadvantaged minorities, distribution to needy customers of wood cut from rights-of-way for heating and cooking, counseling to explain assistance alternatives to needy customers and both direct and indirect financial support for worthwhile social, health and educational programs.



One key to the financial success of South Carolina Electric & Gas was completion of its 900-MW V.C. Summer nuclear plant and getting it into the rate base in 1984. SCE&G is the 17th investor-owned utility to be selected to receive the annual Electric Utility of the Year Award.

Supreme Court clears way; GPUN restarts TMI-1 reactor

MIDDLETOWN, PA—It finally happened on October 3.

After receiving U.S. Supreme Court approval, GPU Nuclear returned the undamaged Three Mile Island Unit 1 to service for the first time since it was shut down for refueling Feb. 17, 1979.

The plant is in the process of a gradual full-power ascension that the utility estimates will take three months. TMI-1 began producing power for the utility's system October 9.

"The plant has been performing very well," GPU Nuclear President and Chief Executive Officer Philip R. Clark told a news conference the morning of startup. "We are very pleased with the progress of startup at this point. Everything has been going smoothly. Our instructions to the operating crews have been to proceed deliberately and carefully, placing primary assurance on doing things safely."

Nuclear Regulatory Commission inspectors and a nuclear engineer from Pennsylvania's state government monitored the unit's startup.

The Supreme Court became involved in the matter when the citizen's group protesting restart of the unit asked that a federal appeals court stay on restart be extended.

Three Mile Island Alert had said

more hearings on safety and management competence issues needed to be held before startup.

Court vote

By an 8-1 vote, with Justice William Brennan dissenting, the Court lifted an appellate court stay on restart. Earlier, Brennan had stopped TMI-1's return to service to allow interested parties to file arguments for restart.

Last May the NRC voted to allow the plant to restart, but the 3rd U.S. Circuit Court of Appeals placed a stay on the order. TMI Alert, the Union of Concerned Scientists and Pennsylvania Gov. Dick Thornburgh asked that restart be delayed until further public hearings could be held.

With the Court's ruling, Thornburgh said he has decided to accept the unit's return to power.

"I believe the only responsible course now is to work with the plant operator, the NRC and other officials to ensure that the plant is operated under the tightest possible supervision and stringent standards of safety," said the governor in a prepared statement.

Thornburgh pointed out that he was never opposed to restart on an ideological basis and that he believes

Continued on page 7

Tax reform may mean lower liabilities for utilities, says EIA

WASHINGTON, D.C.—Tax liabilities of electric utilities will decline significantly if President Reagan's tax reform proposal is passed, according to a recent Energy Information Administration study.

EIA said the present value of tax liabilities over the 1986-1995 period would be \$33.9 billion, compared to \$66.3 billion under current law.

The report, *Analysis of the Impacts of the President's Tax Proposal on Major Sectors of the Energy Industry*, says that the tax liabilities of utilities will be lower each year because the corporate tax rate will be lowered.

President Reagan has proposed lowering the corporate tax rate to 33 percent for taxable income in excess of \$75,000. The current tax rate reaches a maximum of 46 percent on taxable income greater than \$100,000. Changes in corporate and individual rates would take effect July 1, 1986.

Consumers would benefit from the decreased tax liabilities. EIA projects that electricity prices would be lowered by approximately four percent.

The report noted that aggregate electricity demand is expected to increase about one percent in relation to the price decline. EIA said the demand change would be "too small an increase to significantly change requirements for new generation capacity."

Under Reagan's proposal, the cur-

rent 10 percent investment tax credit would be eliminated. EIA said this would result in lower cash flow for utilities.

EIA said total cash flow would be reduced eight percent or \$15.6 billion.

"As a consequence," reported the study, "utilities are estimated to be required to raise an additional \$8.1 billion in debt and \$8.5 billion in equity over the 1986-1995 period, a 52-percent increase in debt and equity compared to the current tax law, and an amount equivalent to nine percent of proprietary capital in 1995."

Although cash flow would initially be reduced, EIA pointed out that in later years, customers would pay higher electricity prices as they were charged for equipment purchased without the benefit of the investment tax credit.

"Cash flow for almost all utilities would be reduced by the proposed tax changes," revealed the study. "The combined impact of eliminating the investment tax credit, recapturing depreciation, and reducing the marginal corporate tax rate would dominate the effects on cash flow."

Changes

The tax reform package would:

- change the current depreciation base and rate schedules to account for inflation and for different rates of economic depreciation.
- institute depreciation recapture to

Continued on page 6

● **GPU Nuclear Corp.** announced in September that an independent investigation of leak rate testing before March, 1979 at Three Mile Island Unit 2 shows the testing procedure was defective. Conducted by Edwin Stier, a lawyer and former director of the New Jersey Division of Criminal Justice, the investigation was commissioned by GPU Nuclear in January 1984. Metropolitan Edison, the former operator of the plant, pleaded guilty in 1984 to a charge in a 1983 indictment that it failed to have an adequate test to measure TMI-2 leak rates as required by its license. Stier found that the test didn't work because of errors in the computer program and faulty instrumentation. GPU Nuclear said the report discovered that TMI-2 operations department personnel discarded test results. Stier's investigation determined that none of the Met Ed directors or GPU Nuclear directors and officers were to blame. The utility has organized a panel of GPU System operating company executives to assess the behavior and performance of individuals who were involved in the TMI-2 leak rate testing and who presently are employed by the system.

● **GPU Nuclear also** announced that its cleanup of TMI-2 remains on schedule and within its \$1 billion budget. As of June 30, the utility said it has spent \$561 million on the cleanup. Reactor defueling was supposed to begin in late October.

● **Directors of the Southern Company** voted to increase the company's common stock quarterly dividend three cents to 51 cents a share to stockholders of record Nov. 1. The new dividend, which is a 6.25 percent increase over the previous rate, is equivalent to an annual rate of \$2.04 a share.

● **Topeka Group, the diversification subsidiary of Minnesota Power,** signed a letter of intent in September to invest more than \$22 million in the preferred stock of Deltona Corp., a Florida-based land development and water utility company. Topeka Group also stated that the transaction involves proposed loans and loan guarantees of up to \$6.5 million to Deltona. Topeka already operates water and wastewater treatment facilities in northern and central Florida through its Southern States Utilities subsidiary.

● **Owners of the Seabrook Station** voted in September to go to full-construction funding for the remainder of the year. New Hampshire Yankee said the vote raises project funding from its present level of \$5 million per week to \$10 million per week in two steps. Full funding of \$10 million per week began Oct. 1. "This increase in funding and move to a full-construction level of activity will allow us to keep this job on-schedule and on-budget and to continue our preparations for hot-functional testing," noted New Hampshire Yankee President Edward A. Brown. "In November we will actually produce some electricity with this plant, and I think that will be a clear sign to everyone that this project is in the final stages of completion."

● **UtiliCorp United Inc., parent company of Missouri Public Service** and Kansas Public Service, said it and HNG/InterNorth have signed a definitive agreement under which UtiliCorp will purchase HNG/InterNorth's Peoples Natural Gas Company division. Price of the transaction was not announced. Peoples Natural Gas provides retail distribution services to 300,000 customers in more than 300 communities in five midwestern states. UtiliCorp's President and CEO Richard C. Green said, "We look forward to the addition of the high-quality Peoples operation to UtiliCorp. This acquisition is a major step in our growth strategy, which seeks prudent expansions through mergers or acquisitions."

● **UtiliCorp also** announced the signing of a definitive agreement for the acquisition of electric distribution properties in West Virginia from Virginia Power. UtiliCorp's President Richard Green said the purchase price for West Virginia Power, an operating division of Virginia Power, will be about \$20 million. West Virginia Power serves more than 22,000 customers in a 1,500-sq. mile area. It has assets of approximately \$20 million and in 1984 reported revenues in excess of \$18 million. Because of needed regulatory approvals, UtiliCorp noted

the purchase could take several months to complete.

● **Commonwealth Edison** has devised a Jobs Preservation Rate which will provide discounts ranging from 20 to 100 percent of demand charges to qualifying industrial customers. The utility estimates that about 100 of its 600 large industrial customers could qualify for the rate which is subject to approval by the Illinois Commerce Commission. "Large industrial electricity customers tend to be large employers," stated Edison Chairman and President James J. O'Connor. "Our new rate is intended to create new jobs, preserve existing ones, and enhance the total economic development of northern Illinois." To be eligible for the new rate, Edison said a customer must demonstrate a probable maximum demand of at least 5,000-kW in at least nine months of each contract year at its service location. The rate also stipulates that an increase in the customer's business activity must account for the increased kilowatt-hour use or demand.

● **The Canadian Electrical Association (CEA)** says a new study shows that optimal conservation can reduce Canada's energy consumption by 1.5 to 1.8 percent and peak demand by 3.0 to 3.7 percent. The report, *An Evaluation of the Cost Effectiveness of Electrical Energy Conservation in Canada*, indicates there are substantial opportunities for utility cost savings from conservation and that the greatest potential for savings are from single family dwellings, apartments and appliances. It showed that total utility cost savings could amount to \$950 million in 1996 and \$1.5 billion per year by 2000.

● **U.S. nuclear capacity will** increase 7.5 percent a year from 1984 to 1990, but then fall to a 1.3 percent yearly increase between 1990 and 1995, projected the Energy Information Administration (EIA) in a new report. EIA predicts that nuclear generation will account for 14.9 percent of the country's total generation in 1985, increase to 19.6 percent by 1990, and then drop to 18.9 percent in 1995. The report, *Commercial Nuclear Power: Prospects for the United States and the World*, assumes that no new nuclear generating units will be ordered in time to operate before the year 2000. Last year, stated the report, 86 U.S. nuclear units produced 13.6 percent of the nation's total electricity generation. According to EIA, 21 nations produced nuclear generated electricity in 1984. The study said foreign commercial nuclear generation rose significantly last year. France and Belgium generate more than half of their electricity from nuclear power and Taiwan and Sweden are expected to shortly reach the same level, found EIA. For a copy of the report, call EIA at (202) 252-8800.

● **The National Electrical Manufacturers Association (NEMA)** "cautiously applauded" President Reagan's recently announced trade policy plan. NEMA President Bernard H. Falk called Reagan's plan "an important first step in restoring America's global competitiveness." He said American industries need opportunity, not protection. While U.S. electric companies buy worldwide, Falk noted that national electric utilities in many other producer nations remain closed. Thus, he said, those nations' electrical manufacturers have a protected home base from which they can attack world markets. "American manufacturers are only looking for the same market access that we offer to the world, and a balance in exchange rates," he stated. "The president's program looks like a strong and sure step in that direction."

● **The five utilities** building the Nine Mile Two nuclear plant near Oswego, NY and the New York Public Service Commission staff have agreed that the cost of the project to be paid by utility consumers should be capped at \$4.45 billion, with the currently estimated balance of \$900 million to be paid by the co-owners in proportion to their ownership share of the plant. The 91 percent-finished Nine Mile Two is projected to cost a total of \$5.35 billion and is scheduled for commercial operation in Oct. 1986. PSC staff representatives and the utilities filed the proposal in mid-September. It has not yet been voted on by the full commission. The Nine Mile Two co-owners said in a statement that their agreement in no way concedes any imprudence but recognizes in part the reality of the regulatory response to the rate impacts of new nuclear facilities. Nine Mile Two is owned by Niagara Mohawk (41%), Long Island Lighting Co. (18%), New York State Electric & Gas Corp. (18%), Rochester Gas & Electric Corp. (14%) and Central Hudson Electric & Gas Corp. (9%). Niagara Mohawk said, "Although the amount to be levied against the companies is large, we feel compelled to accept it because of the benefits to our customers and companies in avoiding lengthy, costly and disruptive proceedings at this stage of the project."

● **Babcock & Wilcox Canada** and Marubeni Corporation of Japan completed a contract in September to supply and install two-400 MW boilers for the Surabaya Power Plant on Java, Indonesia. The demand for electrification on Java grows 20 percent a year.

● **Philadelphia Electric Company** has asked the Pennsylvania Public Utilities Commission for permission to raise its rates 9.4 percent in each of the next three years to recover the costs of its \$3.8 billion Limerick-1 nuclear plant. Under the phase-in plan, PE's revenues would increase \$224 million each year. The utility said the portion of the total amount ultimately approved by the PUC but not billed to customers during the first two years, will be recovered over a three year period beginning June 1989.

● **Atlantic Electric** filed a request with the New Jersey Board of Public Utilities for a \$37 million decrease in its Energy Adjustment and Hotel-Casino Service Adjustment clauses. The utility said monthly residential bills would decrease by 3.5 percent to 6.4 percent according to how much electricity a customer uses. "Our nuclear power units are performing better than they have in years past, so we haven't had to buy as much oil to generate electricity," explained Senior Vice President of Planning and Rates Brian Parent. "And we expect continued good production from our coal-fired units as well."

In This Issue

Editorial	4
Calendar	9
South Carolina Electric & Gas is Utility of the Year.	11
Utilities are buying fluid bed combustion systems.G	24
The transmission link under the English Channel has been finished.TD	40
A sulfur dioxide scrubber's operating problems are solved by converting it to gypsum production, a salable byproduct.G	42
New Products	51
New Literature	54
Personnel	58
Readers' Service	59
Regulatory Review	62
Management Methods	66

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

Astrotech subsidiary wants to be electric utility in space

PITTSBURGH—Can electricity be generated and transmitted in space?

That's what Astrotech International Corporation's subsidiary, Space Shuttle of America Corp., wants to know. The Pittsburgh-based firm has hired Arthur D. Little, Inc., to conduct a study exploring the means of generating, transmitting, converting and storing power in space.

"We want to operate as an electric utility in space," Space Shuttle of America President Don Stitt told *EL&P*.

He hopes to have a test power generating unit in space in approximately three years. Stitt said it probably would be tethered to one of NASA's shuttles and would be capable of producing about 7-12 kW.

Stitt expects that the first units will use some form of solar array panels to generate electricity.

Space customers

Customers for the firm's power could be the space shuttle, low-earth orbit space stations, free-flying platforms and strategic defense facilities.

Stitt said the power units "could extend the life of the space shuttle from seven days to two weeks."

The idea, he explained, is to place the units into the same orbit as the stations and shuttle—between 100 and 200 miles above the earth's sur-

face. The electricity would then be transmitted by possibly microwave or laser technology.

He predicts that the first free-flying, commercial unit will produce between 12 and 25-kW. He hopes to eventually put into orbit a power station capable of generating 75 to 100-kW.

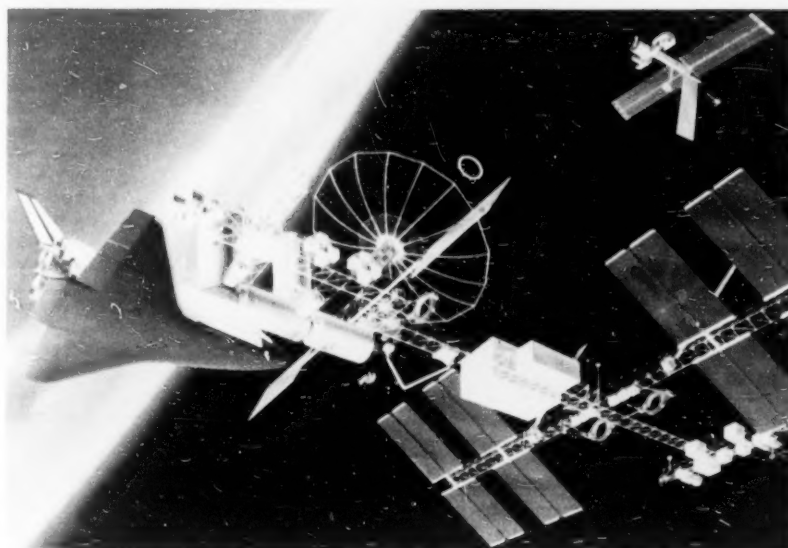
The A.D. Little study, which should be complete in the first quarter of 1986, will evaluate the technical aspects of space power, costs, potential applications for government and commercial users, and regulatory and legal issues.

Space Shuttle of America says the concept of industrial parks in space is moving toward realization, because of NASA's recent approval for building the first space station. It will be the hub of an industrial park, which will include orbiting satellites for experiments and development of products.

Willard F. Rockwell, Jr., Astrotech chairman and chief executive officer, called the study "the link necessary to move from the role of space traveller to space resident."

Dr. Peter E. Glaser, Little's vice president of advanced technologies will be overseeing the study.

"The space station will be the first piece of a space industrial park that will allow a gradual buildup of com-



An artist's rendering of what a future space station might look like. Space Shuttle Corp. of America has hired Arthur D. Little, Inc. to conduct a feasibility study for supplying commercial power to customers in space through an orbiting utility (top right of drawing).

mercial and research facilities in low-earth orbit. These facilities will provide the infrastructure for scientific investigations and product manufacturing," explained Glaser. "The critical dimension of this complex is a reliable power source. That is what we

are studying."

Glaser said he expects that opportunities for services in support of the space industrial park to constitute a business exceeding \$10 billion.

Stitt said Space Shuttle of America will not build the power units.

Electricity costs were highest last year in New York City

WASHINGTON, D.C.—Residents of New York City paid more for their electricity last winter than anyone else, according to a nationwide survey conducted by the National Association of Regulatory Utility Commissioners (NARUC).

In its seventh winter residential electric bill survey, NARUC said the nationwide average cost of electricity is 8.02 cents per kilowatt-hour (kWh). In New York, residents paid 15.35 cents per kWh. The least expensive service territory was Lewiston, Idaho where customers paid about 3.5 cents per kWh.

The survey found that typical residential electric bills varied by over 450 percent depending on the service area in which the consumer is located.

It compares bills of the 194 largest service territories of the major investor-owned electric utilities. NARUC looked at the bills for residential electric service for the months of December 1984 and January and February of this year.

Other high bills were paid by residents of Hilo, Hawaii (14.25 cents); Kahului, Hawaii (14.00 cents); and Long Beach, New York (13.53 cents).

Some of the lowest bills in the country were found in Spokane, Washington (3.63 cents); Kalispell, Montana (3.76 cents); and Ontario, Oregon (3.85 cents).

NARUC reports that its survey shows that residential bills have increased approximately 4.56 percent over those bills reported in last year's survey. During the same period, said NARUC, the Consumer Price Index took a 4.0 percent jump.

Regional analysis

A regional analysis of electric bills showed that rates in the Northeast and Pacific regions were the most expensive, while those of the Northwest and Rocky Mountain regions were least expensive.

Copies of the 211-pp. report may be obtained from NARUC, P.O. Box 684, Washington, D.C. 20044, for \$15.50 per copy.

10 MOST EXPENSIVE SERVICE TERRITORIES (1984-85)					
Company	City	State	Total bill	Avg. cost cents/kWh	Nation rank
Consolidated Edison Co. of N.Y.	New York	New York	\$230.23	15.35	1
Hawaii Electric Light Co.	Hilo	Hawaii	\$213.68	14.25	2
Maui Electric Co.	Kahului	Hawaii	\$210.01	14.00	3
Long Island Lighting Co.	Long Beach	New York	\$202.99	13.53	4
Orange & Rockland Utilities, Inc.	Middletown	New York	\$199.87	13.32	5
San Diego Gas & Electric Co.	San Diego	California	\$191.07	12.74	6
The United Illuminating Co.	Bridgeport	Connecticut	\$190.56	12.04	7
Central Hudson Gas & Elec. Corp.	Poughkeepsie	New York	\$177.23	11.82	8
Jersey Central Power & Light Co.	Dover	New Jersey	\$175.38	11.59	9
Rockland Elec. Co.	Ramsey	New Jersey	\$171.38	11.42	10
10 LEAST EXPENSIVE SERVICE TERRITORIES (1984-85)					
Company	City	State	Total bill	Avg. cost cents/kWh	Nation rank
Washington Water Power Company	Lewiston	Idaho	\$80.30	3.35	194
Washington Water Power Company	Spokane	Washington	\$64.46	3.63	193
Pacific Power & Light Co.	Kalispell	Montana	\$66.50	3.76	192
Idaho Power Co.	Ontario	Oregon	\$67.78	3.85	191
Idaho Power Co.	Boise	Idaho	\$69.70	3.96	190
Pacific Power & Light Company	Yakima	Washington	\$80.36	4.06	189
CP National Corp.	La Grande	Oregon	\$66.85	4.36	188
Pacific Power & Light Company	Portland	Oregon	\$68.73	4.56	187
Puget Sound Power & Light Co.	Bellevue	Washington	\$71.09	4.74	186
Portland General Elec. Co.	Portland	Oregon	\$71.92	4.90	185

Commonwealth Edison announces new austerity program

CHICAGO—As part of a new austerity program, Commonwealth Edison said it has frozen some management wages and is re-evaluating its ambitious nuclear construction program.

Edison Chairman and President James J. O'Connor said the program is designed to offset reduced revenues which resulted from one of northern Illinois' coolest summers and a continuing sluggish economy.

John Hogan, Edison spokesman, said kilowatt-hour sales were "flat as a pancake" this past summer. He pointed out that kWh-sales to large industrial and commercial customers were down 2.8 percent over the last six months.

The salary freeze is estimated to affect approximately half of the utility's

6,500 management work force.

Hogan said lower levels of management can expect "minimum salary increases".

Part of the program is an evaluation of the company's construction. O'Connor mentioned that Edison will examine the economics of continuing to operate some of its fossil plants and whether it should accelerate, delay or stop any of its generating station construction.

Edison is currently constructing the two-unit Braidwood nuclear plant and the two-unit Byron nuclear station.

One scenario being explored, said Hogan, is hiring another contractor to speed-up work at Braidwood-2.

Although Hogan said the utility is

not anticipating any layoffs at this time, he said they are a possibility. No plants have been identified by Edison for closing, but Hogan pointed out that the utility has one oil-fired plant that is costly to operate.

According to O'Connor, the program also is being implemented in anticipation of changes in federal tax laws.

Loss of the investment tax credit will result in a loss of between \$820-\$960 million between 1986 and 1988 for Edison, said Hogan.

The austerity program is no cause for concern, assured Hogan. "These are just some corrections that needed to be taken," he stated.

Details of the austerity plan should be finalized in December, Hogan said.

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Court says munis have relicensing preference

Don Minner
Associate Editor

WASHINGTON, D.C.—A federal appeals court panel has affirmed that municipal electric systems have a preference in obtaining hydro projects whose licenses are up for renewal.

Specifically, a three-judge panel of the U.S. Court of Appeals for the District of Columbia reversed a Federal Energy Regulatory Commission (FERC) decision and ordered the commission to give the license to operate the Merwin Dam in Washington to a local municipal corporation. Merwin has been operated for the past fifty years by Pacific Power & Light Company.

Utility spokesperson Glenn Gillespie admitted Pacific Power was "surprised" by the decision. He said the company is deciding whether to file an appeal with the Supreme Court or the appeals court.

Public power agencies and investor-owned utilities are in heated de-

bate over whether a 'preference' exists in deciding relicensing cases. The Federal Power Act of 1920 does have a municipal preference provision. The debate hinges on whether the preference applies to new projects only, or to both new developments and ones which are up for relicensing.

The Merwin Dam is located on the Lewis River between Clark and Cowlitz Counties. It has a capacity of about 136-kW. Pacific Power has transmitted the dam's power to six states, but has not served local communities.

Bulk power

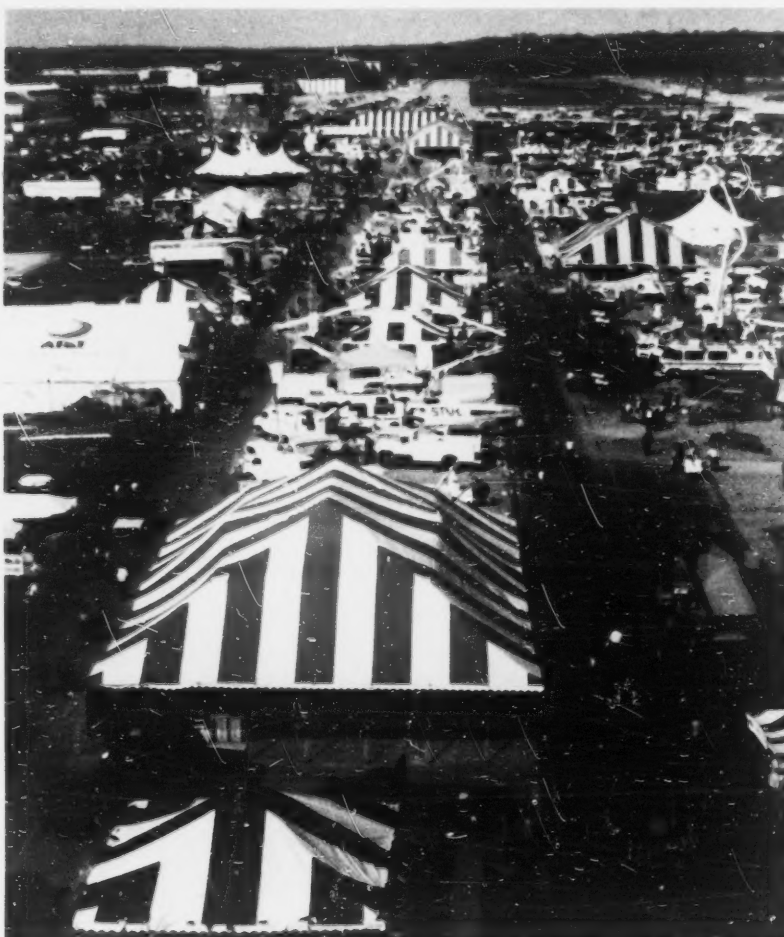
Public utility districts in each county receive bulk power from the Bonneville Power Administration and distribute it to their customers. The counties wanted Merwin, so they would no longer need to purchase power.

When the license to operate the dam came up for renewal in 1979, the

Continued on page 7



Located on the Lewis River in Washington, the Merwin Dam creates a reservoir covering about 4,000 acres and containing more than 400,000 acre ft of water. A federal appeals court has ruled that the license to operate the dam be given to a local municipal corporation.



Equipment show reflects upbeat activity

The 1985 International Construction and Utility Equipment Exposition was the biggest ever, setting records in attendance, number of mechanized T/D construction and maintenance equipment exhibitors and amount of display and demonstration space used. The three-day show, held every two years, reflected a strong, positive business climate, a complete turnaround from two years ago. A photo report appears on pages 12 and 13.

U.S. letting transmission R&D leadership slip away

ST. CHARLES, IL—Fifteen years ago the U.S. "would have" been rated No. 1 in developing transmission technologies, according to the transmission department director of the Electric Power Research Institute.

Speaking at a recent National Association of Regulatory Utility Commissioners transmission conference, Narain G. Hingorani said the "picture doesn't look so good" for future U.S. research and development in transmission equipment. (See chart, p.3)

"It must be realized that apart from the fact that many European countries and particularly Japan have closed utility markets, there is a considerable percentage of utility revenue plowed back into R&D," he explained.

Utilities in Europe put an average of two percent of their revenue back into research and Japan uses three percent, said Hingorani. U.S. utilities only put aside an average of .3 percent of revenues for R&D.

"No industry can survive without an influx of new ideas, new materials and new concepts," he stressed.

Where utilities, industry research groups and government have been able to fund R&D to a reasonable extent, U.S. industry has remained in a leadership position. For example, Hingorani said the nation remains at the forefront in transformer, arrester, control and protection, power semi-conductor and HVDC research.

Manufacturers given up

However, he pointed out, in areas where business has been depressed for several years, manufacturers

have given up on utilities.

"For example, 10 to 12 years ago," noted Hingorani, "the U.S. had the best technology in the world in the circuit breaker area; now the U.S. circuit breaker business has virtually all gone to Japan. The gas insulated substation business has been lost entirely to Europe and Japan. The business of porcelain insulators has virtually been lost to Japan."

"The business of CTs and PTs have departed for Europe, and others such as underground cables, power semi-conductors and line conductor may follow."

Long-term transmission planning has ceased being effective in the U.S., which could lead to future chaos, according to the EPRI director.

"The public could suffer frequent blackouts and even higher cost electricity because we lack enough transmission to utilize lower cost power sources," said Hingorani.

Risky to invest

The current depressed utility business makes it risky to invest in R&D, thus, he explained that the R&D burden has shifted even more towards organizations like EPRI, DOE, ESEERCO and utilities.

He told the NARUC conference attendees that utilities in this country have not built enough transmission in recent years. As a result, Hingorani noted that there is a shortage of transmission capacity in many areas of the nation.

"In this regard," he said, "the situation here is much more difficult than

Continued on page 3

MSU reports lower earnings

● Middle South Utilities, Inc. (MSU) reported earnings per share of \$2.07 for the first nine months of the year, down from \$2.38 for the same period of 1984. Net income also decreased \$15.5 million to \$410.0 million. MSU attributed the declines to the failure of regulators to approve adequate rate adjustments for the Grand Gulf-1 nuclear plant. MSU's operating subsidiaries have been struggling to make payments on their shares of the unit. Louisiana Power & Light became the last of the four companies to receive limited rate relief, when the 19th Judicial District Court in Louisiana authorized the utility in October to immediately implement retail rates and charges to recover Grand Gulf costs. The increased rates will provide the company with a gross annual increase in revenues of \$113.9 million. Also in October, Moody's Investors Service announced it was lowering the preferred stock ratings of LP&L from "b2" to "caa". Moody's said the downgrade reflects the omission of the quarterly dividend payable in November and uncertainty as to when it will be resumed.

'Buy American' bill passed

● Congress approved and has sent to President Reagan a \$15.25 billion energy and water appropriations bill, which includes a "buy American" provision for federal power agencies. If the bill is signed, power marketing administrations and the Tennessee Valley Authority would be required to purchase their extra high voltage (EHV) power equipment from domestic manufacturers if the domestic equipment meets the agency's technical requirements and the cost of the equipment is not more than 25 percent greater than the price of the most competitive foreign bid. The provision, which would be in effect for one year, would not apply to the acquisition of spare parts, or to any purchases made before the bill is signed. According to the U.S. Dept. of Commerce, the EHV power equipment industry includes, transformers rated above 10,000-kVA; fuses rated above 2,300-V and above; circuit breakers rated 345-kV and above; relays, capacitors; surge arresters; AC/DC valves and controls; high voltage DC systems; and tapered tubular steel structures or structural units to support overhead transmission lines.

Utilities agree to merge

● Iowa-Illinois Gas and Electric Co. and Sherrard Power System have agreed to merge. "We believe the merger with Sherrard Power will be of benefit to customers of both utilities," said Iowa-Illinois President Barry C. O'Brien. "By combining our organizations, we will be able to take advantage of economies in administrative and operational areas." Both boards of directors approved the \$10 million merger in October. Iowa-Illinois will keep its name and the area now served by Sherrard will become the Sherrard Power System District of Iowa-Illinois. Currently, all of Sherrard Power's electric requirements are met by Iowa-Illinois under a wholesale agreement. Sherrard Power has 52 employees and approximately 13,000 electric customers in Illinois.

China awards contracts

● The People's Republic of China has awarded the lead contracts for two high-voltage direct-current (HVDC) converter stations to BBC Brown Boveri. The firm said the stations will cost \$870 million to construct. Both stations will be part of a 625-mile, 500-Kv transmission line that will run from hydro plants on the Changjiang River to the city of Shanghai.

WPPSS to preserve WNP-3

● The Washington Public Power Supply System received formal approval of its preservation and preventive maintenance program for Nuclear Project No. 3

(WNP-3) from the Nuclear Regulatory Commission. WNP-3 construction was halted in July 1983 when the project was 76 percent complete. WNP-1 was 63 percent complete when stopped in April 1982. The Supply System said it is the first utility to receive NRC approval for a preservation program at a partially completed nuclear plant. "This three-year effort will cost about \$3 million for each plant," said Managing Director Don Mazur. "I feel it will be money well spent if it permits us to resume construction with complete documentation and verification that work already completed is acceptable." Following formal NRC acceptance of the total WNP-3 Readiness Review Program, the utility said efforts will be concentrated on WNP-1.

PacifiCorp ups dividend

● PacifiCorp increased its quarterly common dividend from 58 cents to 60 cents per share. Don Frisbee, chairman & chief executive officer, said the change reflects PacifiCorp's improved financial strength and real earnings growth. "Our earnings are currently 80 percent cash versus 50 percent for the electric utility industry overall," explained Frisbee. The company's electric utility, Pacific Power, contributes 55 percent of PacifiCorp's \$2 billion annual revenue. The increase brings the annual dividend to \$2.40 from \$2.32.

Uncollectible account survey out

● The National Association of Regulatory Utility Commissioners (NARUC) is making available copies of a recently completed survey of utility uncollectible accounts and service disconnections. The report tabulates the level of utility uncollectible accounts and the number of service disconnections for nonpayment from information collected from more than 350 electric and gas utilities. Copies of the Survey of Electric and Natural Gas Utility Uncollectible Accounts and Service Disconnections for 1984 can be obtained for \$10 from NARUC, P.O. Box 684, Washington, D.C. 20044.

Tax reform would hit coal industry

● The U.S. coal industry would be hit with a 73 percent increase in tax liabilities if the federal tax reform plan proposed by the House Ways and Means Committee staff were adopted, says a new study. The National Coal Association said a recent Price Waterhouse analysis found that the package would mean an additional \$1.6 billion in taxes over the next five years for the coal industry. Price Waterhouse said that President Reagan's tax proposal would boost tax liabilities of the industry 68 percent, a \$1 billion increase. The main reason for the tax increase is the committee's plan to repeal the percentage depletion allowance, which is a method that mining companies use to recover the capital costs of a non-reproducible resource.

St. Lucie sets state records

● Florida Power & Light Company's St. Lucie nuclear unit 1 was shut down Oct. 20 for refueling after setting new statewide records for operation. The utility reports that its 827 MW unit had a capacity factor of 97.8 during 226 days of continuous on-line service—new Florida records for nuclear plant operation. The unit is scheduled to return to service on Dec. 26. FPL will replace approximately one-third of the reactor's 217 fuel assemblies.

New England utilities exchange power

● Public Service of New Hampshire agreed in October to exchange 200 MW of its oil-fired Newington plant for 200 MW of oil-fired capacity and 25 MW of gas turbine capacity owned by Connecticut Light and Power Company. PSNH said it expects the arrangement will save its customers more than \$6 million in the next year. The utility wanted the capacity to replace power it will lose when the Newington plant goes down for maintenance. CL&P customers will benefit from fuel savings. PSNH said neither it, nor Connecticut Light & Power will pay a capacity or transmission charge.

Addison named Exec of Year

● Southern Company President Edward L. Addison has been named 1985 Energy Executive of the Year by the Association of Energy Engineers. The group chose Addison because of his role in the company's huge power plant construction program. Southern Co. intends to spend more than \$2 billion annually through 1987. The group also cited him for his efforts in helping to diversify the company into other energy-related fields. He has served as president and chief executive officer of the utility since 1983.

CommEd granted rate increase

● Commonwealth Edison Co. was granted a \$495 million rate increase in order to help pay for its \$2.5 billion Byron-1 nuclear plant. The Illinois Commerce Commission voted four to three to approve the 11 percent increase in electric rates. The commission disallowed more than \$50 million of Edison's request because it said the costs were due to the utility's delay in starting up the unit. The phase-in plan calls for two-thirds of the rate increase to go into effect initially, with the remaining one-third phased-in starting in Jan. 1987. Average residential rates will rise 14.7 percent, said the commission. ICC Chairman Philip O'Connor noted, "We want to avoid rate shock which could lead to customers dropping off the electric system which in turn would hurt those who have no other option but to remain." The two commissioners who dissented, Susan Stone and Mary B. Bushnell, said that the commission had not adequately determined that all costs associated with the construction of Byron-1 were reasonable. Commissioner Andrew Barrett voted for no increase.

In This Issue

Editorial	4
Calendar	9
ICUEE '85 was bigger and better than ever	12
Annual Calendar of Events	15
A new electrostatic coal cleaning system that offers 40-percent sulfur reduction at half the cost of conventional methods	18
ASEA's commitment to U.S. utilities grows	20
New Products	23
Bulletin Board	24
Readers' Service	27
Personnel	31
Regulatory Review	32
Management Methods	34

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1. The T/D edition carries two dots (••). All readers receive EL&P's industry news section.

Pacificorp broadens diversification efforts into finance

CHICAGO—Pacificorp, the electric utility industry's most heavily diversified company, is pushing into the area of financial services, Chairman Don Frisbee told a recent meeting of Chicago security analysts.

The Portland, Oregon-based company recently purchased a Chicago-based leasing firm called Northwest Acceptance Corp. The acquired firm, with 1984 revenues of \$40 million and assets of \$220 million, will be operated as a separate subsidiary.

An existing subsidiary called Pacificorp Finance has been active in leveraged leasing investments. It has \$125 million in assets and has invested \$37 million.

Finance is Pacificorp's fourth major area of corporate activity, Frisbee said, joining the electric utility, a telephone business, and a coal mining venture.

Pacific Power, the electric utility accounted for 57 percent of 1984 revenue. Pacific Telecom, the phone company, accounted for 22 percent and NERCO, the coal operation, accounted for 21 percent.

The company's major problem, its involvement in the WPPSS nuclear project, is now behind it with a \$300 million writeoff already taken, corporate executives told the analyst group.

Redeploying cash

The challenge now, said Frisbee, is "redeployment of cash flow," with several hundred million dollars of cash coming in to the corporation yearly. The company is in a strong financial position with net income up an average of 25 percent a year for the last five years. Rate of return on equity, at the allowed level of 16 percent, is twice what it was five years ago.

Electric utility capital spending is set at \$150 million a year for the next five years with no new generation required, compared to \$250 million a year for the last five. All capital will be provided for internally.

Further diversification is an attractive prospect for Pacificorp, but the company is still interested in the electric utility business. Electric demand

in the company's existing service territory, largest in the U.S., is expected to grow at an annual rate of 2 to 3 percent. With a generous generating reserve margin, the company is working to raise that to 3 to 4 percent.

"We like the electric business," said Steven Raforth, Pacificorp's financial vice president. The corporation is looking to buy new service territories and has a bid outstanding for the electrical distribution system of Gillette, Wyoming. It had bid on the CP National territory that was sold to Idaho Power last fall.

The electric business accounted for 90 percent of the company's revenue until about 12 years ago, Frisbee recalled. Getting a jump on the trend now gaining momentum in the industry, the company started diversifying by purchasing two small telephone exchanges. That grew into the company's telephone subsidiary that is now valued at \$500 million. Its largest component is the long distance telephone system in Alaska.

The other major diversification effort started right after the oil boycott

in 1973 when company executives foresaw a runup in fossil fuel prices. They owned huge coal reserves in north central U.S. and saw an opportunity to market to other companies the one billion tons of coal it owned that it didn't need to fuel its own power plants.

NERCO

The mining subsidiary, NERCO, is now valued at \$380 million. It has long-term contracts with eight electric utilities. (Wisconsin Public Service Co. recently signed up.) It sells 27 million tons of coal a year. The company recently went after the European steam coal market in a joint venture with Mitsubishi.

There have been some recent problems in the mining area. A contract dispute with Lower Colorado River Authority remains to be settled and expansion into precious metal mining has not been helped by low prices. However, NERCO's ROE has grown at an annual rate of 20 percent and company officials are optimistic about future prospects.

OFFERINGS OF SECURITIES BY INVESTOR OWNED PUBLIC UTILITY COMPANIES (\$000)

	January 1 to September 30, 1985		January 1 to September 30, 1984	
	Total	Electric	Total	Electric
Long-Term Debt				
Offered Publicly	10,952,305	7,979,805	5,809,380	5,384,380
Offered Through Subscription	—	—	—	—
Offered Privately	241,582	191,582	376,500	341,500
Total Long-Term Debt	11,193,887	8,171,387	6,185,880	5,725,880
Preferred Stock				
Offered Publicly	445,000	445,000	668,000	568,000
Offered Through Subscription	—	—	—	—
Offered Privately	—	—	120,000	120,000
Total Preferred	445,000	445,000	788,000	688,000
Common Stock				
Offered Publicly	1,790,971	1,281,196	709,343	681,689
Offered Through Subscription	—	—	—	—
Total Common Stock	1,790,971	1,281,196	709,343	681,689
Total Financing	13,429,858	9,897,583	7,683,223	7,095,569

Source: Ebasco Business Consulting Company - October, 1985 (Preliminary)

Utility financing up in first 3 quarters

NEW YORK—Total utility financing during the first nine months of 1985 was \$13.4 billion, 74 percent higher than the \$7.7 billion issued during the same period last year.

A report prepared by Ebasco Business Consulting Company found that electric utility financing in the first three quarters rose 39 percent to \$9.9 billion. That includes \$3.8 billion of pollution control revenue bonds.

Long-term debt

Long-term debt issued by electric utilities increased to approximately \$8.2 billion, from last year's \$5.7 billion. Total long-term debt issued by all utilities almost doubled to \$11.2

billion, compared to \$6.2 billion in the first nine months of 1984.

Preferred stock financing by electric utilities in the period was down sharply to \$445 million, from 1984's \$688 million. Offerings of preferred stock by all utilities also dropped, from last year's \$788 million to \$445 million in 1985.

Common stock

Common stock financing for electric utilities doubled to about \$1.3 billion, from 1984's \$682 million. Total utility common stock financing in the first nine months was \$13.4 billion, a sharp increase from last year's \$7.1 billion for the same period.

PG&E to acquire Pacific Gas Transmission Co.

SAN FRANCISCO—Pacific Gas & Electric Co. and Pacific Gas Transmission Co. announced October 24 that they have entered into a definitive merger agreement by which PGT will become a wholly-owned subsidiary of the utility.

Pacific Gas & Electric presently owns 50.2 percent of the outstanding PGT shares.

Under the agreement, PG&E will buy all 4,648,454 shares of PGT com-

mon stock in exchange for PG&E common stock valued at \$30.50 per share of PGT common stock.

To be completed

The utility said it anticipates the merger to be completed sometime around April 1986.

PGT's principal business is the operation of a natural gas pipeline between Alberta, Canada and California.

Will Chicago pull plug on Commonwealth Edison?

CHICAGO—Upset with steadily increasing electricity costs, the city of Chicago is studying the possibility of buying its power from someone other than Commonwealth Edison.

Chicago Mayor Harold Washington has asked his planning department to study options for obtaining electricity elsewhere. Heading up the inquiry will be Director of Energy Management Charles Williams.

"Projections vary, depending on the plans of Edison," speculated Williams, "but we expect to see rate increases of as much as 40 percent in the next few years."

Williams told *EL&P* the city spends between \$32 and \$34 million per year for its electricity. The city pays an average of six cents per kilowatt-hour for power for its municipal facilities and O'Hare Airport. Electricity for streetlights costs about four cents per-kWh, he noted. Total electricity usage for the city's municipal facilities last year was 670 million-kWh.

In addition to rising costs, Williams said the study also was prompted by the recent decision of the city of Geneva, Ill. to look into leaving the Edison system to obtain cheaper power from Wisconsin.

"This isn't meant as a blow against Commonwealth Edison," stressed Williams. "We want to evaluate our choices as a consumer."

Among the options the city will consider is purchasing power from other sources and wheeling it through Edison's system. Also, the group will look into the possibility of establishing a municipal generating company.

Williams said the evaluation will examine the feasibility of buying the utility's distribution network.

Municipal waste-to-energy plants could also be a partial solution to the city's high bills, he added. Chicago has approximately seven to ten years of useful landfill space left.

Commonwealth Edison spokesman John Hogan admitted the city's announcement took the utility by surprise. Even an Edison official serving on the Mayor's Energy Commission did not know of the study proposal, noted Hogan.

He called the options "impractical

and uneconomical."

When added together, Chicago's municipal facilities, O'Hare Airport, and streetlights make the city Edison's third largest customer.

Hogan explained why one option would be uneconomical. "If they wanted to buy our distribution system, it would cost in excess of five billion dollars. And that doesn't even include any generating facilities," he said. "I don't believe they have that kind of capital."

If the city wanted to wheel power through Edison's system, it might not be economical either, Hogan said.

"We own the electric highway into the city," he stated. "We would have to negotiate a price for them to use it and they might find it too high."

Agreement expires soon

The franchise agreement between Chicago and the utility expires in 1990 and no negotiations on a new pact have begun, pointed out Hogan.

"We're wondering if this may not be the opening salvo," he questioned.

Chicago's money would be better spent on hiring an energy consultant, believes Hogan. He said the utility has offered to sit down with the city and discuss ways to achieve energy efficiencies.

Williams pointed out that the utility recently cut the rates of some municipal districts by as much as 30 percent, in exchange for the municipalities agreeing not to leave the system.

However, Williams said, the study "shouldn't be perceived as a bargaining chip. This is not an effort to have Edison subsidize the city."

Seven municipalities in the area buy wholesale power from the utility and distribute it themselves. Hogan said all have, at some time, talked about pulling out, but only Geneva (Pop. 8,900) has gone very far with the idea.

"The ball is in their (Geneva's) court," said Hogan. We have made them an attractive counter-offer to keep them on the system."

If the city does go elsewhere for its electricity, Hogan said there would be no reason for the utility to retain its headquarters in Chicago.

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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Report details competitive threat to U.S. companies

Some U.S. generation system suppliers may not survive

WASHINGTON—Manufacturers of power generation equipment—primarily fossil and nuclear steam generation systems and turbine-generators—are in for hard times in the next decade and not all will survive, a new Department of Commerce report concludes. However, the report says, "some U.S. production capacity should survive until demand improves," depending on their success in developing repair and maintenance services, adapting to new technological opportunities (such as cogeneration) and marketing in developing nations.

But substantial obstacles stand in the way of achieving each of these three survival requirements, the report says.

Pointing out that "To remain viable, the domestic generating equipment industry must maintain technological leadership and provide utilities with equipment to generate electricity less expensively than equipment offered by offshore manufacturers, the report warns that manufacturers must do so at a time when demand for new units is at record low levels with little likelihood of an increase before the mid-1990s.

Without sufficient orders generat-

ing adequate revenues to encourage companies to maintain a high level of research and development, the report concludes it will be difficult for U.S. generation equipment manufacturers to maintain the technological edge necessary to compete effectively.

Titled "A Competitive Assessment of the U.S. Electric Power Generating Equipment Industry," the report presents a dark picture of the future for power generation equipment manufacturers. Even so, it is a much watered-down version of the original draft, sources say.

Report concludes

The report concludes with options the federal government could exercise to enable the generating equipment industry to improve its viability and survive. These options range from broader financing assistance via the Export/Import Bank and AID programs to substantial protective alternatives, including strengthening the "Buy American Act," encouraging manufacturers to pursue anti-dumping cases, restricting foreign supplier access to the electric utility market for generating equipment unless the domestic markets of those offshore suppliers are opened equita-

bly to U.S. suppliers and the like.

The U.S. is still the world leader in production and consumption of electricity and in 1984 installed U.S. generating capacity was 31 percent of total world capacity. But, according to the DOC report, the U.S. share of world power generating equipment exports has eroded from 21.3 percent in the 1955-1975 period to 12.5 percent in the period since 1975. Furthermore,

the U.S. share of the world turbine-generator market declined from 51.3 percent in the 1970-1973 period to 45.4 percent in the 1978-1981 period.

At the same time, offshore suppliers have made substantial inroads in the U.S. market for power generation equipment, increasing to 43 percent of the U.S. hydropower generator market and 10 percent of the U.S.

Continued on page 5

State Supreme Court denies recovery of Bailly-1 cost

INDIANAPOLIS—Northern Indiana Public Service Co. (NIPSCO) will not be allowed to recover its \$191 million investment in a nuclear plant it cancelled four years ago, ruled the Indiana Supreme Court Nov. 19.

Upholding an appeals court decision, the Supreme Court ordered the Indiana Public Service Commission by a 3-2 vote to vacate a 1982 order allowing the utility to recover the costs for its cancelled Bailly-1 nuclear unit.

In a dissenting opinion, Judge Dixon W. Prentice wrote, "Not only do I

regard the decision of the majority to be in gross error, as a matter of law, I believe the result to be a societal disaster. Capital for utility companies subject to the law of this case will, in my judgment, be available only at extremely high rates—if at all. What have historically been regarded as conservative low risk securities will become highly speculative."

The court's decision may have an impact on Public Service Company of Indiana and how it attempts to recover the costs for its cancelled Marble Hill nuclear plant. The utility had been awaiting a decision in the NIPSCO case before proceeding.

According to the Supreme Court, Bailly-1 was never "used and useful" property. NIPSCO argued that the amortization of the sunk costs for the unit is an allowable operating expense.

NIPSCO spokesman Phil Phelan said the Hammond, Ind.-based utility will file an appeal for rehearing with the state Supreme Court.

The utility has already collected \$38 million over the past three years from ratepayers for Bailly-1. He explained that the money cannot be refunded until the appeals process is exhausted.

Dividend stopped

In addition, the NIPSCO Board of Directors voted on Nov. 26 to withhold the fourth quarter common stock dividend. Phelan said bankruptcy is not a threat at this time. He noted that about 10 to 12 percent of NIPSCO's workforce has been laid off over the past few years and that cost-cutting measures have been in effect.

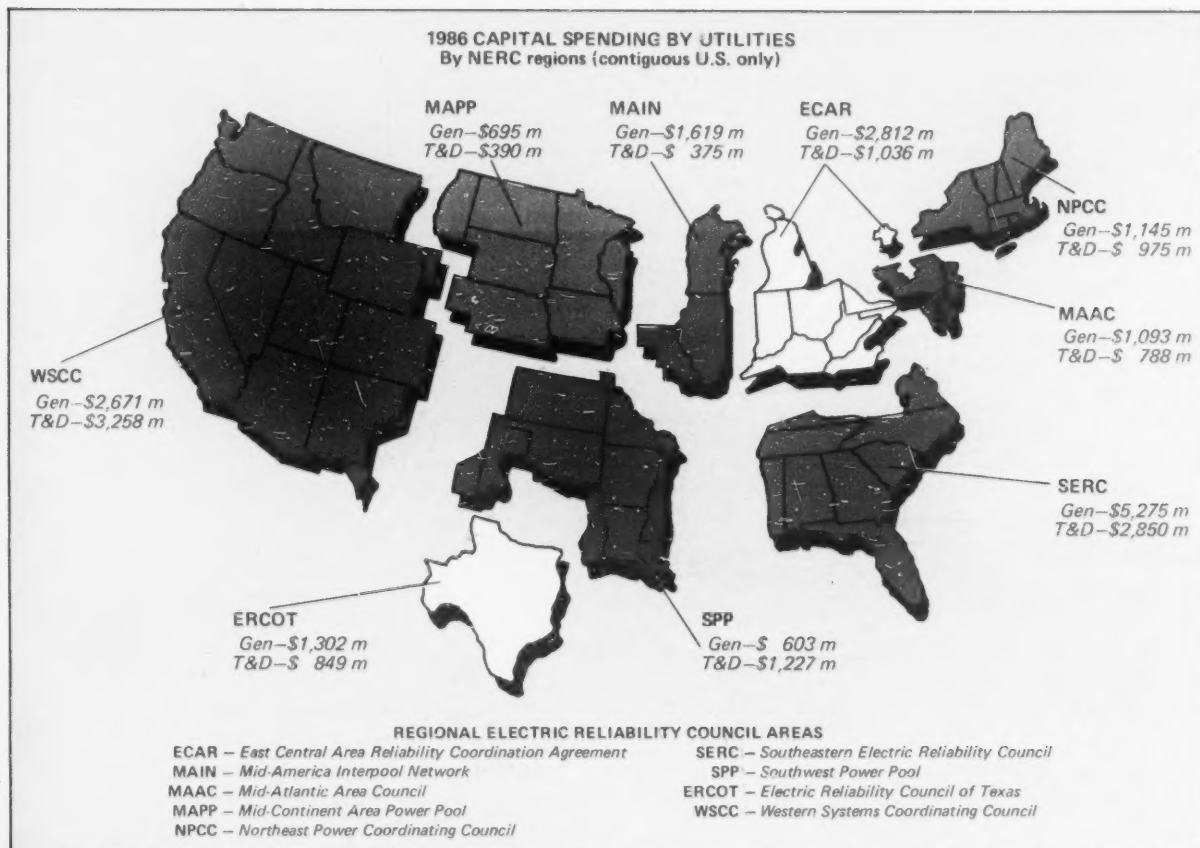
A construction permit for the 644 MW, Bailly-1 was obtained in 1970. At that time the plant was expected to be completed in six years for a cost of \$187 million.

When the plant was cancelled in August 1981, approximately \$191 million had been spent and one percent of the unit had been constructed.

Over at Public Service Co. of Indiana (PSI), spokeswoman Chris Combs said the utility is studying options to recover its \$2.5 billion investment in the cancelled Marble Hill plant.

Continued on page 9

Where electric utility capital spending will take place in '86



Electric utilities will spend some \$30.7 billion for new and upgraded facilities in 1986. According to EL&P's Forecast Report, beginning on page 13, industry capital investment will decline steadily through 1990.

Edison's nuclear program pushed back

Commonwealth Edison Company pushed back the completion dates for its three nuclear units still under construction. The utility said Braidwood-1 (90% complete) will now be in service by May 31, 1987, instead of the previous date of Oct. 1, 1986. Braidwood-2 (60%) is now scheduled for service by Sept. 30, 1988, instead of Dec. 31, 1987. The schedule for Byron-2 was postponed eight months until May 31, 1987. Edison also revised the total construction cost estimates for the units. The Braidwood station estimate rose from \$4.11 billion to \$5.05 billion, while the price tag for the Byron station went up to \$4.65 billion, from the previous estimate of \$1.18 billion. When the project began in 1973, Edison said it would cost \$934 million to build the Braidwood units. Also in 1973, utility officials estimated the Byron station could be completed for \$902 million. In October, the utility announced a new austerity program that included an examination of its construction program. Commonwealth Edison said preliminary results indicate that completing the units under construction as soon as possible is still the lowest cost alternative. "Our plan is to get the three remaining units in our construction program up and running as soon as possible," said Edison Chairman and President James J. O'Connor.

Cost for Comanche Peak rises almost \$1 billion

A reinspection and reanalysis of the two-unit Comanche Peak nuclear plant shows that it will take almost \$1 billion more to complete than the last estimate, said Texas Utilities. The utility said it will cost \$5.46 billion, including Allowance for Funds Used During Construction, to put Unit 1 into commercial operation in mid-1987 and Unit 2 on-line six months later. Texas Utilities had estimated in January 1985 that the plants would cost \$4.56 billion. That estimate was based on a commercial operation of Unit 1 in early 1986 and Unit 2 in mid-1987. The reinspection was undertaken in response to safety questions raised in the licensing process. Texas Utilities Electric Co., the electric subsidiary, owns about 88 percent of the plant. The remaining share is owned by Texas Municipal Power Agency, Brazos Electric Power Cooperative, Inc. and Tex-La Electric Cooperative of Texas, Inc. In the new estimate, Texas Utilities Electric's share rose to \$4.64 billion, from \$3.9 billion.

West Valley contract extended

The U.S. Dept. of Energy will extend the contract of the West Valley Nuclear Services Company for five years beginning Oct. 1, 1986. The company, a subsidiary of Westinghouse Electric Corp., operates the West Valley Demonstration Project. The firm will solidify 600,000 gallons of liquid high level radioactive waste. Beginning in 1988, the world's largest slurry fed ceramic melter will begin converting nuclear waste to borosilicate glass.

Northwest Energy buys three firms

Northwest Energy Services Co. (NESCO), a joint-venture owned by the four Pacific Northwest investor-owned utilities, recently announced the acquisition of three new subsidiaries. NESCO bought Engineering and Design Associates in Oregon; Continental Power Resources Co. in New Jersey; and B.C. Power Services in Washington. Craig Davies, president and chief executive officer of NESCO, said, "These three companies give NESCO full-service engineering, construction and maintenance capability. Our potential is enormous and our commitment to fulfilling that potential is unwavering." The firm is owned by Pacific Power & Light, Portland General Electric, Puget Sound Power & Light and Washington Water Power.

Consumers Power studies Midland conversion

Consumers Power Company will study options for utilizing its mothballed \$4 billion Midland nuclear plant. William T. McCormick, Jr., the new chairman and chief executive officer of the utility, said the study will consider several non-nuclear conversion options, including a combined-cycle natural gas plant and a coal-fired plant. "I wish to emphatically state that the new management of Consumers Power is not committed to a nuclear completion of Midland," he said in a prepared statement. "In fact, for a variety of political and financial risk reasons, at the present time, the nuclear completion option may be the least viable of the several major options." The state public service commission told the utility to go ahead with the study if it were done internally.

TVA shuffles nuclear program

Prompted by the shutdown in August of its Sequoyah nuclear plant and a number of Nuclear Regulatory Commission fines, the Tennessee Valley Authority has announced new management controls for its overall nuclear program. TVA submitted the information to the NRC in order to show the plant is ready for safe operation. "I believe we're submitting a solid package of information to the NRC that demonstrates the necessary actions have been and are being taken in order to resume operation of Sequoyah," said Hugh Parris, TVA Manager of Power and Engineering (Nuclear). The TVA Board of Directors said it will hire a senior nuclear advisor and hold special board briefings dedicated solely to the nuclear program. Also, TVA announced that nuclear safety review staff senior representatives will be assigned full-time to individual plant sites. An Office of Inspector General, with broad investigative and reporting powers, will be created to receive employee concerns about nuclear activities. TVA also took several other management restructuring steps to shore up its nuclear program. Both Sequoyah units were ordered shut down by TVA because significant deficiencies were discovered in the documentation of environmental qualification of safety-related electrical equipment.

B&W, China form joint venture

Babcock & Wilcox International in Ontario and Beijing Boiler Works of Beijing, China have agreed to form a new joint venture called Babcock & Wilcox Beijing Co. (China) Limited. B&W said the agreement was signed in October after almost two years of negotiations. The first contract for the new company is expected to be a 200 MW boiler for the Xin-Hai Power Project in the Jaing Su province. First shipments are expected to begin in 1987. According to B&W Canada, ten B&W representatives will be stationed in Beijing to help coordinate the expansion of two-thirds of the existing Beijing Boiler Works facilities. Training of Chinese personnel will take place over the next three years at sites in the U.S., Canada and China.

Don't sell Conrail, says Reed

"Now is not the time to turn our backs on competition," warned Conrail President and Chief Operating Officer Stuart M. Reed. Speaking at a Cincinnati Coal Exchange meeting in November, he predicted that a sale of Conrail to Norfolk Southern Corp. would inhibit competition in the railroad industry. "The export outlook for coal is more positive than it has been," noted Reed, "and coal's share of U.S. energy has made gains during the last decade." He told the group that Conrail has been profitable each year since 1981, including a \$500 million net income in 1984 and \$330 million net income for the first nine months of 1985. Reed said, "There is no such thing as a captive coal mine because the coal mine operator and the railroad work as partners to capture business to their mutual benefit. The bottom line is that when you (as producers) make money, we make money. When you lose an order, we lose that freight business. We are a competitive threat even if we do not serve your mines. We keep the CSX and Norfolk Southern on their toes."

Elderly customer training program developed

In an effort designed to enhance the electric utility industry's ability to serve the elderly, the Edison Electric Institute said it has developed an Elderly Customer Awareness Training Program. EEI, along with the American Association of Retired Persons and the Center for Studies in Aging at North Texas State University, designed the program to help utilities and their older customers address the needs of the fastest growing segment of the U.S. population. Mary Ann Bernald, EEI's manager of consumer affairs, said, "This program will assist electric utility employees in recognizing and understanding the physical, social and psychological needs and values of older customers. The program will teach improved communication skills to foster better understanding and to increase sensitivity to the needs and problems of the elderly." According to EEI, approximately one of every nine Americans is aged 65 or older. The program features a 30-minute introductory videocassette tape which explains the various methods of dealing with elderly customers. For more information on the program, call Bernald at (202) 828-7506.

Testing completed at Seabrook

New Hampshire Yankee announced the successful completion of a month-long test sequence designed to demonstrate the plant's ability to generate electricity. New Hampshire Gov. John Sununu said the completion of "hot-functional" testing shows that Seabrook will play a significant role in meeting the future energy needs of New Hampshire and New England. New Hampshire Yankee Senior Vice President William B. Derrickson said, "Late spring, we will be ready to load fuel into the reactor and, less than a year from now, this plant will be ready for commercial operation." During the testing, Derrickson said the plant produced and distributed electricity three times.

In This Issue

Editorial	4
Calendar	7
\$30.7 billion will be spent for new facilities in 1986, EL&P's annual survey reveals	13
WEPCO commits to 500MW AFBC order G	18
A ruling on Central Illinois Light's "bubble" proposal to slash SO ₂ control costs is expected soon from EPA G	22
A 129-mile fiber optic communications line has been built by South Carolina Electric & Gas on existing T-line right-of-way TD	31
New Products	32
Readers' Service	33
New Literature	36
Regulatory Review	37
Management Methods	38

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BG&E says EPZ for Calvert Cliffs should be reduced

BALTIMORE—Baltimore Gas & Electric Co. wants to cut its emergency planning zone (EPZ) around its Calvert Cliffs nuclear plant from 10 miles to two miles.

The utility filed a petition for the reduction in November with the Nuclear Regulatory Commission (NRC). Every large light water reactor plant is required by the NRC to have an EPZ with an area of approximately 10 miles in radius surrounding the plant.

If a plant can show good cause, the NRC rules allow exemptions.

BG&E asked the commission to approve a reduction based on information taken from studies done by the utility and the NRC.

Rich Olson, principal engineer for nuclear licensing and analysis at BG&E, said recent source term data from the NRC, the American Nuclear

Society and others were used by BG&E to determine that a two mile emergency planning zone radius would be adequate.

Risk overestimated

According to BG&E, the studies show that previous data overestimated the risk of a major radioactive release to the environment. In the case of the two-unit, 1650 MW Calvert Cliffs plant, BG&E said extensive analysis of the most severe theoretical accident conditions show that exposures that were previously thought to occur at 10 miles would not occur beyond two miles from the plant.

"We are confident, from comprehensive scientific studies, that the releases from a major accident at the Calvert Cliffs plant would be nowhere near what had been previously

projected," stated BG&E Vice President of Engineering and Construction Joseph A. Tiernan. "The Calvert Cliffs plant design, and this body of new data lead us to believe that a two mile EPZ is a more realistic planning zone."

Tiernan noted that the proposed EPZ reduction would not compromise the effectiveness of the emergency planning efforts of the company, Calvert County or surrounding political sub-divisions.

According to 1980 census data, approximately 35,000 people would fall within in a 10 mile radius of the plant and about 500 would be encompassed by a two mile zone.

Modest cost savings

Olson denied that the utility wants to reduce its EPZ for financial rea-

sons. He said BG&E would only realize a modest cost savings of between \$30,000 and \$50,000 per year.

"We simply feel that the ten mile zone is an unduly pessimistic characterization of Calvert Cliffs," stated Olson. "The plant is not dangerous."

He said the public perception of the plant is bad, because the 10 mile zone implies that the entire area inside the EPZ is dangerous. BG&E believes that a reduction of the zone could improve the public's perception of the plant.

NRC spokesperson Sue Gagner said BG&E is the first utility to request an exemption to the regulation requiring a 10 mile EPZ. She pointed out that two nuclear have five mile EPZs, because of their smaller size.

Gagner said the NRC staff is studying BG&E's request.

Industrial equip. sales look strong in '86: manufacturers

VANCOUVER, B.C.—Light construction and industrial equipment sales in 1986 should hold steady at their current pace, say leading manufacturers.

In outlook statements prepared for the Farm and Industrial Equipment Institute (FIEI), the manufacturers said the strong performance of the housing market, affordable mortgage interest rates, and continued state and federal spending on construction projects are some of the reasons for their optimistic feelings.

Sales to electric utilities and telecommunications firms should be strong in 1986, noted Stelco Co. President Wayne R. Stallard.

"Our assessments reflect a commonly-held judgment that the electric utilities will have strong cash flows...providing our customers with cash," predicted Stallard.

Charles Machine Works President Edwin Malzahn believes industrial and construction equipment sales will remain near 1985 levels. He also said that manufacturers will continue to rely on overseas sources for components and machines.

"It may say 'Made in the U.S.A.' on the outside, but the chances are most of it had a long boat ride," said Malzahn.

J.I. Case President Jerome K. Green predicted, "Construction equipment markets are nearing peak levels in the current recovery cycle. Demand for construction equipment is expected to remain steady through the remainder of 1985, then decline slightly."

Massey Ferguson Ltd. Chairman and Chief Executive Officer Victor A. Rice looks forward to continued "modest growth" in the industrial machinery market next year.

He said, "Construction—mainly residential—in North America has responded strongly to the business cycle upturn that began in North America."

River Bend licensed

WASHINGTON, D.C.—A full-power operating license for unit 1 of the River Bend Nuclear plant in Louisiana was issued by the Nuclear Regulatory Commission in November.

The plant, which is owned by Gulf States Utilities and Cajun Electric Power Cooperative, uses a boiling water reactor and will be capable of generating 991 MW.

NEMA predicts gloomy business climate in '86

SAN FRANCISCO—It looks like a gloomy 1986 for U.S. electrical manufacturers.

According to the National Electrical Manufacturers Association (NEMA), the nation's electrical manufacturers expect only slight growth this year.

In its year-end poll of the NEMA membership, the group determined that most sectors of the industry would be running well behind the current real GNP growth rate in 1986.

Unfavorable direction

NEMA President Bernard H. Falk, speaking at the association's annual meeting, said, "Until this year, NEMA product shipments have been pretty well tracked with the economy as a whole. No longer. We've broken the pattern—in a decidedly unfavorable direction."

The association said the 1985 figure of 0.06 percent reflects a substantially lower expectation for the year than previously projected (See chart). For 1986, the NEMA survey projects 1.8 percent real growth.

Electrical building equipment manufacturers are predicting a 0.6 percent growth in 1986. While the poll shows, power equipment manufacturers expect a growth of only 1.3 percent next year.

Manufacturers of lighting equipment believe 1986 will be better than 1985—3.2 percent growth versus 1-1/2 percent this year. NEMA said members of the ballast section expect sales to be up 3-1/2 percent in 1986.

PROJECTED INDUSTRY SHIPMENTS (IN REAL TERMS)* FOR THE ELECTRICAL MANUFACTURING INDUSTRY**		
Summary 1985-1986		
Product category	1985 % Change in sales from 1984 - projected Oct. 1985	1986 % Change in sales from 1985 - projected Oct. 1985
Lighting equipment	+ 1.5	+3.2
Electronic equipment	+ 2.8	+4.5
Industrial equipment	- 1.4	+0.7
Building equipment	+ 4.6	+0.6
Insulating materials	- 4.9	+0.8
Wire and cable	+ .06	+1.9
Power equipment	+ 3.0	+1.3
Diagnostic imaging & therapy systems	-10.5	+1.8
Total industry	+ .06	+1.8

*Including interplant transfers and exports.
**Projection only covers products within the scope of NEMA. Typical products in the scope of each product category are listed on the sheets attached.
Source: NEMA Statistical Department

Insulated electrical and electronic wire and cable manufacturers said they anticipate coming out of a flat 1985 with almost two percent growth next year.

The manufacturing of electric insulating materials, which was expected to drop 4.9 percent in 1985, will rise only 0.8 percent this year.

"We are being beaten too often by foreign competitors," said Falk. "The problems of electrical companies have never been as glamorous or as eye-catching as textiles or wheat or shoes or consumer electronics. Our overall

trade surplus with the rest of the world, lost only recently, camouflaged the dangers in the declining balance of trade."

NEMA said that declining sales for motors and arc welding more than absorb the slight gains expected by industrial control makers.

Concluded Falk, "In 1985 we fell below the line and the downward trend continues. The high value of the dollar, a sluggish world economy and international protectionism all frustrate the competitiveness of American electrical manufacturers."

Shareholders approve Toledo Edison/CEI merger

CLEVELAND—Shareholders of The Cleveland Electric Illuminating Co. (CEI) and Toledo Edison Co. voted in November to approve the merger of the two companies.

Centerior Energy, the new holding company, will be among the nation's 20 largest electric utilities, with total assets of about \$8.4 billion. If approval was obtained from the Securities and Exchange Commission, the affiliation was to have taken effect Dec. 31.

In addition to Toledo Edison and CEI, Centerior said it will have a service company subsidiary. According to CEI, it will coordinate activities such as finance, engineering, management information services, purchasing and nuclear operations to result in greater efficiencies and long-term cost savings.

In documents filed with the SEC, CEI estimated that the merger would

result in benefits equivalent to \$90 million per year over the next 15 years.

CEI said in its report to the SEC, "This affiliation will result in a more broadly experienced, more highly skilled work force at all levels and will make possible improvements in reliability, efficiency and cost savings that will go beyond those identified, and in areas of operations not presently visualized specifically and beyond present ability to quantify."

CEI Chairman Robert M. Ginn, who will serve as president and chief executive officer of Centerior Energy, said details of how the companies will operate following the affiliation are being worked out by teams made up of employees from both companies.

"It will take some time to complete the Centerior Energy organization, consolidate many functions with To-

ledo Edison and work out staffing arrangements," said Ginn. "But we want to take whatever time is needed to do things right...and to accomplish what we set out to do."

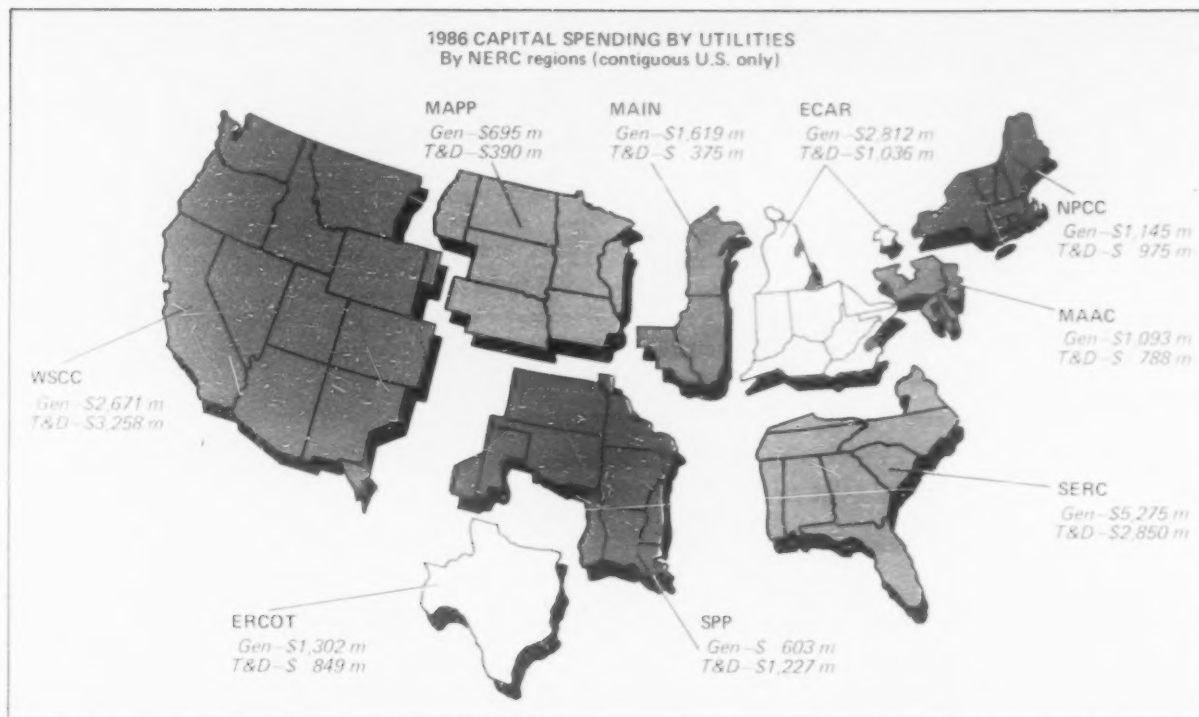
Toledo Edison Chairman and Chief Executive Officer John P. Williamson will serve as Chairman of Centerior Energy.

The merger of the two Ohio utilities was announced in June 1985.

PSE&G sells Eurobonds

NEWARK, NJ—New Jersey's Board of Public Utilities authorized Public Service Electric & Gas Co. (PSE&G) to sell up to \$175 million in bonds in European debt markets.

PSE&G stated that the bonds will be used to help finance \$775 million in planned construction expenditures this year, including \$365 million for the Hope Creek nuclear plant.



Utilities to spend \$30.7 billion in 1986, reduce 5-year total capital spending

Robert A. Lincicome, Editor-in-Chief
Robert W. Smock, Managing Editor
Donald F. Minner, Associate Editor

Electric utilities will continue to cut-back investment in new facilities in 1986 and on through 1990, barring a substantial upturn in economic activity. Current high reserves of generating capacity are allowing most major utilities to postpone new generation system construction programs. The resulting cutback in capital requirements and improving financial conditions are allowing utilities to catch up with previously planned, but postponed distribution upgrading and expansion programs.

But potential effects of Congressional tax reform, legislation and regulatory developments could impact that development severely. And if domestic economic growth should accelerate to any degree, to 3.5 percent or higher from the current 2 percent rate, there are definite possibilities of electricity shortages on a number of major utility systems, which could lead to substantially stepped up generation construction activity beginning in 1988.

Strongest system expansion will take place in those areas currently enjoying the fastest population growth...namely the Southeast and West Coast... and in the heavily industrialized East Central area that was hard hit by the last recession and is only now beginning its recovery.

These are the basic conclusions resulting from *EL&P's* fall survey. The survey involved gathering data and information from more than 200 electric utility organizations, trade associations, government officials, industry leaders and analysts. It was completed in late November.

Capital spending in 1986

The electric utility industry plans to spend \$30.7-billion for new and improved facilities in 1986. This represents an 11.5 percent decrease from planned capital investment in 1985 (actual figures for 1985 are not yet

available). The decrease primarily reflects the electric utility industry's reaction to continuing generation system over-capacity, which has developed over the past four or five

years as new generating plants have been completed and expected load growth did not materialize.

The industry will spend \$17.2 billion for generation system construc-

tion in 1986. The cutback in planned generation investment for 1986 is 20.9 percent from 1985 and 24 percent below 1984 spending. Virtually all of the 1986 spending will go toward projects currently under construction or for upgrading or life extension work. While both of the latter presently involve more discussion than real action, they both are developing and by 1990 will represent a substantial portion of generation capital spending.

Spending for power delivery facilities is expected to total \$11.7-plus billion, up just \$36 million from 1985. This is made up of three categories of investment: substations—\$1.9 billion, transmission lines—\$2.7 billion and distribution—\$7.1 billion. Actually, more than \$1.9 billion will be spent for substations since this figure is based solely on specific substation construction plans reported by utilities. A number of utilities reported that their substation investments were included with their transmission and distribution spending plans. Transmission and distribution spending is therefore overstated by the amount of the substation work included therein.

It is expected that transmission construction activity could begin to increase during the latter part of 1986 as utilities accelerate programs to strengthen and expand tie-lines to neighboring utilities and adjacent power pools so that they can take greater advantage of favorable power purchases from other sources and further postpone generation construction projects. Should they do so, transmission spending could increase by an additional 10-15 percent which would raise total transmission spending to more than \$3.1 billion.

Distribution expansion will continue to be driven by residential construction and commercial activity. With the prospect of lower interest rates and stable prices in 1986, it is possible that housing starts could increase sharply during the last half of

Continued on next page

NORTH AMERICAN ELECTRIC RELIABILITY COUNCILS	
ECAR	East Central Area Reliability Coordination Area
ERCOT	Electric Reliability Council of Texas
MAAC	Mid Atlantic Area Council
MAIN	Mid America Interpool Network
MAPP	Mid Continent Area Power Pool
NPCC	Northeast Power Coordinating Council
SERC	Southeastern Electric Reliability Council
SPP	Southwest Power Pool
WSCC	Western Systems Coordinating Council

1986 CAPITAL SPENDING BY NERC REGION (CONTIGUOUS U.S. ONLY) (in \$1000's)						
Region	Generation	Substation	Transmission	Distribution	Other	Total
ECAR	\$ 2,811,909	\$ 122,145	\$ 191,246	\$ 722,584	\$ 202,520	\$ 4,050,404
ERCOT	1,301,530	14,909	174,026	660,453	113,206	2,264,124
MAAC	1,093,074	83,301	85,610	618,603	225,615	2,106,203
MAIN	1,619,346	62,588	66,654	245,409	70,429	2,064,426
MAPP	694,956	55,452	79,519	254,778	69,236	1,153,941
NPCC	1,145,279	97,048	151,485	726,476	127,217	2,247,505
SERC	5,275,267	580,176	700,548	1,569,563	546,329	8,671,883
SPP	602,584	197,324	336,288	693,177	96,283	1,925,656
WSCC	2,671,554	706,033	917,082	1,634,644	247,055	6,176,368
Total	\$17,215,499	\$1,918,976	\$2,702,458	\$7,125,687	\$1,697,890	\$30,660,510

CHANGING INVESTMENT PATTERN 1986 - 1990					
	1986	1987	1988	1989	1990
Generation	56.1	52.1	47.3	49.3	49.8
T&D	38.4	43.3	48.2	46.5	46.2
Other	5.5	4.6	4.5	4.2	4.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%

1986. If they should, distribution system expansion could surge, carrying over into 1987.

Miscellaneous system capital investment is projected at \$1.7 billion, up \$600 million, or 55 percent, from 1985.

Outlook through 1990

Beyond 1986, capital spending will continue to decline. By 1990, total capital expenditures are projected to be down to \$20.1 billion. Annual capital expenditures are projected as follows: 1987—\$26.9 billion, 1988—\$24.0 billion, 1989—\$21.0 billion and 1990—\$20.1 billion.

During this period, spending for generation will decline steadily, from \$14.0 billion in 1987 to \$11.3 billion in 1988 to \$10.4 billion in 1989 to \$10.0 billion in 1990.

Spending for power delivery facilities will decrease also, from a high of \$11.6 billion in 1987 to \$9.3 billion in 1990. However, because generation spending will decrease more, proportionately, during this period, power delivery spending will represent a larger share of total spending. From 38.4 percent of total spending in 1986, power delivery investment will increase to 43.3 percent in 1987 and 48.2 percent in 1988 before dipping slightly to 46.5 percent in 1989 and 46.2 percent in 1990.

Miscellaneous capital spending will decline as a share of total capital spending from 5.5 percent in 1986 to 4.6 percent in 1987 and steadily to 4.0 percent in 1990. The decline in dollars is substantially greater, falling from \$1.7 billion in 1986 to \$1.2 billion in 1987 and ultimately to \$814 million in 1990.

Faster growth, greater spending

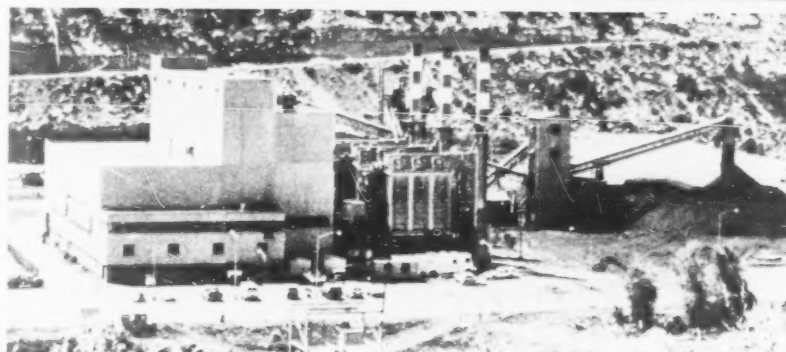
These projections are based on economic growth continuing through the period at a 2 percent per year rate. Should economic activity accelerate to the 3- or 3.5-percent level or higher, projected system requirements in 1988, 1989 and 1990 could lead to substantially increased capital spending across the board.

PROJECTED 5-YEAR CAPITAL EXPENDITURES By NERC Region - in \$ millions

Region	1986	1987	1988	1989	1990	5-Year total
ECAR	\$ 4,050	\$ 3,729	\$ 3,501	\$ 3,415	\$ 2,613	\$ 17,308
ERCOT	2,264	1,867	2,461	2,671	2,148	11,411
MAAC	2,106	1,947	2,103	2,008	1,584	9,748
MAIN	2,064	2,115	1,546	1,209	1,149	8,083
MAPP	1,154	1,142	876	890	920	4,982
NPCC	2,248	2,200	1,747	1,600	1,591	9,386
SERC	8,672	6,436	5,408	3,887	3,743	28,146
SPP	1,926	1,988	2,005	2,160	2,392	10,471
WSCC	6,176	5,474	4,364	3,203	3,964	23,181
Total	\$30,680	\$26,897	\$24,012	\$21,043	\$20,104	\$122,716

PROJECTED 5-YEAR CAPITAL EXPENDITURES By Function - in \$ millions

	1986	1987	1988	1989	1990	5-Year total
Generation	\$17,215	\$14,015	\$11,364	\$10,401	\$10,010	\$ 63,005
Substations	1,919	2,189	2,267	2,231	1,570	10,176
Transmission	2,702	2,856	2,639	2,034	2,010	12,241
Distribution	7,126	6,592	6,658	5,493	5,700	31,569
Other	1,698	1,245	1,084	884	814	5,725
Total	\$30,660	\$26,897	\$24,012	\$21,043	\$20,104	\$122,716



Colorado Ute's Nucla station is the site of one of the utility AFBC projects intended to demonstrate the viability of the technology.

SELECTED ALTERNATIVE GENERATING AND STORAGE TECHNOLOGIES: TYPICAL SIZES AND APPLICATIONS IN THE 1990s Typical configurations in the 1990s

Installation size (MW)	Base load (60-70% CF)	Dispatchable applications ^a		Nondispatchable applications ^b	
		Intermediate load (30-40% CF)	Peaking load (5-15%)	Intermittent (w/o storage)	Others (not utility controlled)
Greater than 250 MWe	Coal gasification/combined cycle Conventional coal	Coal gasification/combined cycle	n.a.		
51-250 MWe	Geothermal Atmospheric fluidized-bed combustor	Atmospheric fluidized-bed combustor Compressed air storage (maxi CAES) Solar thermal (w/storage)	Compressed air storage (maxi CAES) Solar thermal (w/storage)	Solar thermal Wind	Atmospheric fluidized-bed combustor Solar thermal (w/storage)
1-50 MWe	Geothermal Atmospheric fluidized-bed combustor Fuel cells	Fuel cells Compressed air storage (maxi CAES) Solar thermal (w/storage)	Compressed air storage (mini CAES) Battery storage Fuel cells Solar thermal (w/storage)	Solar thermal Wind Photovoltaics	Atmospheric fluidized-bed combustor Geothermal Fuel cells Solar thermal (w/storage) Battery storage Compressed air storage (mini CAES) Geothermal
Less than 1 MWe		Combustion turbine		Solar thermal Wind Photovoltaics	Fuel cells Battery storage

NOTES: For each unit size and application, new technologies are shown above the dotted line and conventional technologies are shown below the dotted line.

CF = capacity factor; and n.a. = not applicable.

^a Dispatchable technologies may not be utility-owned.

^b Note that nondispatchable technologies may serve base, intermediate, or peaking loads.

SOURCE: Office of Technology Assessment.

EL&P projections based on increased economic activity indicate that total spending would increase in 1988 to \$27.0 billion and would fall only slightly, to \$26.3 billion in 1989 and to \$26.1 billion in 1990. Thus, for the five year period 1986-1990, total capital spending would run \$137.0 billion, compared with \$122.7 billion based on projected 2 percent economic growth.

Spending in all categories would be increased (industry totals based on two-percent economic growth given in parenthesis for comparison). Generation spending would rise to \$69.5 billion (\$63.0 billion) for the five-year period. Power delivery capital spending would be as follows: Substations—\$11.2 billion (\$10.2 billion); Transmission—\$14.0 billion (\$12.2 billion); Distribution—\$35.7 billion (\$31.6 billion). Miscellaneous capital spending would total \$6.6 billion (\$5.7 billion).

Business environment

Utilities face an unsettling business climate in 1986 and beyond. This is in spite of conditions that in many ways are quite favorable.

On the one hand, kilowatt-hour sales are increasing steadily, if not dramatically. Revenues, net incomes and earnings for shareholders are up, stocks of investor-owned utilities are selling above book value again and rates of return for many utilities are at or near allowable limits. Utilities are generating more and more of their capital funds internally and borrowing requirements are down.

On the other hand, some utilities, essentially the ones with continuing or recently completed nuclear construction programs and who need to recover their enormous investments through rate relief, are under severe financial pressure. Many utilities—in fact, most utilities—face overcapacity problems, which are a special concern to regulatory agencies. Concurrently, state commissions are encouraging development of industrial cogeneration, which can reduce industrial demand and load at the very time that overcapacity already is a problem.

Utilities also are confronted with specific national legislative issues. For example, the matter of public power preference in hydro relicensing, modification of the Staggers Rail Act, nuclear licensing reform, renewal of the Price-Anderson Act, tax reform, acid rain legislation and transmission access are just a few of the issues of importance to utilities.

On the state level, the overcapacity problem could lead to state utility commission moves to counter the situation by deregulating electric utilities and letting competitive forces dictate price and rate of return. Prudence in management is another weighty concern for regulators and this, coupled with the industry's highly profitable performance in 1984 and 1985 could lead to strong downward pressures when utilities apply for rate increases.

Technological development

The rapidly developing fluidized-bed boiler is the highlight of the near-term outlook for technological change in the electric utility industry. This is a major modification of the standard coal-fired boiler. It offers low sulfur dioxide emission while burning high-sulfur coal without requiring a back-end stack-gas scrubber—making it enormously attractive to many utilities who are looking to coal as the fuel of the future.

This year and next will see the startup of prototype fluid-bed projects at Northern States Power

Continued on page 16

Energy secretary committed to nuclear power

SAN FRANCISCO—"Licensing and regulatory reform is perhaps the most crucial and essential step needed to restore the viability of the nuclear option," declared U.S. Energy Secretary John S. Herrington.

Speaking before the annual meetings of the Atomic Industrial Forum and the American Nuclear Society in November, Herrington outlined a five-point plan to restore nuclear power in America.

He told the audience that they need to:

- be better advocates for nuclear power.
- have licensing and regulatory reform.
- put in place a nuclear waste management system.
- press on with research and development.
- capitalize on the potential of foreign markets.

Committed to nuclear energy

According to the secretary, he and President Reagan are "irrevocably committed to nuclear energy as an option for our future."

Herrington said it is clear that a great deal of electric generating capacity must be added in the next decade.

"We developed the technology that the rest of the world has borrowed. And we have no intention of presiding over the demise of the American nuclear industry," he asserted. "We will not walk away from world leadership or contribute to a day when Americans will have a second-class nuclear industry."

Although the temptation is to place the blame for the U.S.'s nuclear problems on regulators and environmentalists, Herrington said industry must take its share of the responsibility for the planning, management and construction problems plaguing nuclear power.

Herrington told the convention attendees to tell the public that nuclear power is safe, economical and necessary. Everything possible has to be done to show that the industry is operating nuclear units safely and reli-



John Herrington

ably, he added.

Ease the stranglehold

Something has to be done, he said, to ease the regulatory stranglehold that the industry is suffering from.

"We simply must end this destructive practice of design-as-you-build, endless backfitting, and a licensing process which allows issues to be raised again and again even after they seem to have been finally resolved," Herrington told the ANS/AIF audience. "We must gain control of this process."

He said he will be pushing the administration's "one-step" licensing legislation this year. The bill would allow the Nuclear Regulatory Commission to approve, in advance, standardized designs and plant sites separate from a utility's application to construct a plant.

"I will urge the Congress to see the wisdom of a new and better approach to nuclear licensing," promised Herrington.

He expressed concerns over making sure the nation's electric utilities are never undercapitalized.

"This can only be realized," he said, "if rate regulatory policies are far-sighted and oriented toward providing the necessary incentives for efficient capital investment. North Carolina, Arizona, Virginia, South Carolina and Florida are among the states that have policies that recognize this need."

According to the energy secretary, the problem of nuclear waste is tech-

nically solved. "Now we need to tell the story," he said. "We need to educate the public so they will come to understand that nuclear waste can be handled, processed and disposed of in complete safety."

He assured the group that DOE is working to make certain that nuclear energy remains a future U.S. option.

DOE plans to support industry R&D by concentrating on simplification and standardization of plant de-

sign and simplification of operations.

He said the administration is looking for ways to remove foreign trade barriers to the nuclear power industry.

"Selling American technology abroad is good business," declared the secretary. "In these days of huge trade deficits we should vigorously exploit every opportunity to take part in nuclear developments abroad."

Capital spending . . . from page 14

and Colorado Ute. However, the rest of the utility industry has jumped the gun and is starting to order fluid bed systems on a commercial basis. Several preliminary orders have been placed and half a dozen more are being negotiated. These are small systems, 100 to 150 MW.

Another technology for new capacity that is of interest to utilities is the combination coal gasification plant/combined cycle generating system. A prototype is successfully operating on the Southern California Edison system, but so far no one has ordered a second.

A third new technology touted for new coal-fired capacity is the supercritical pulverized coal system—a technology well established in the '60s but then largely abandoned due to the poor reliability of early units. A reappraisal of the supercritical boiler led by EPRI has done much to repair its reputation and re-establish it as a viable choice for new capacity.

Nuclear technology development is primarily aimed at improving operating reactors. With little prospect for new nuclear plant orders in the foreseeable future, the emphasis will be on the plants now operating and those in the final stages of construction. Life extension, capacity-factor improvement, and extended fuel burnup are examples of the programs currently underway.

The prospects for exotic forms of energy production such as wind machines are dubious with the expira-

tion of federal tax credits at the end of 1985.

The drive to convert existing oil-fired capacity to burn coal has suffered a temporary lull due to the precipitous drop in residual oil prices in 1985 and the prospect of continued low oil prices. Oil-fired utilities like Boston Edison have shelved conversion plans. Others, like Florida Power & Light, have, temporarily at least, lost interest in technologies such as coal-water fuels that could be burned in oil-design units. Work on coal-water fuels will continue in 1986 but large-scale commitments are doubtful until the price gap between coal and oil increases significantly.

Long-term, the price differential is expected to change in coal's favor and coal's share of electricity production is expected to rise from today's 60 percent to 70 percent by the end of the century.

The looming threat of acid rain regulations is spurring a good deal of technological development aimed at developing retrofit control methods.

The cost of coping with such requirements by retrofitting conventional scrubbers to old power plants or by switching to low sulfur coal in those plants would be huge. A better way to deal with acid rain would be a retrofit emission control method that might not be 90 percent efficient, but would cost substantially less.

Current research and development work is looking at technologies like injecting alkali reagents such as limestone into the furnaces of older plants. The alkali reacts with SO₂ forming a particulate that can be collected in the existing precipitator. Other research teams are investigating injection of sorbents in the ductwork between the air heater and the precipitator.

Successful development of cheap emission control techniques could lead to adoption of legal requirements to use them.

On the T&D side, development work continues on new technologies such as distribution automation, load management, and fiber optic data transmission. The fiber optic data technology is also a part of the budding utility diversification movement. Like railroads, some electric utilities have discovered the commercial possibilities of using their long-distance rights-of-way for installing new data link technology.

Summary

For 1986 and the following four years, it seems that utilities will concentrate on strategies that avoid construction of new, high-cost generating facilities, to avail themselves of low-cost purchased power from other sources and to reduce capital requirements. They also will focus system technological system development on those disciplines that offer the greatest probability of improving system productivity and reducing risk.

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THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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Acid rain envoys recommend \$5-billion program

Don Minner
Associate Editor

WASHINGTON, D.C.—Special envoys appointed by President Reagan and Canadian Prime Minister Brian Mulroney to look into the problem of acid rain have recommended that the U.S. initiate a five-year, \$5-billion program to commercially demonstrate new clean coal technologies.

In addition, U.S. envoy Drew Lewis and Canadian envoy William Davis recommended the continued practice of bilateral consultations and information exchange. Also, they said a greater emphasis should be placed on research concerning transboundary acid rain issues.

Said Lewis, "This report is a significant step forward for both the United States and Canada. The technology demonstration program should help us find cheaper controls. The research program should help ensure that any future control program will achieve its intended results. The cooperative activities will foster ongoing, high-level discussions between our two countries. In short, our recommendations today prepare a very solid base for future action."

ed States and Canada. The technology demonstration program should help us find cheaper controls. The research program should help ensure that any future control program will achieve its intended results. The cooperative activities will foster ongoing, high-level discussions between our two countries. In short, our recommendations today prepare a very solid base for future action."

Serious environmental concern

In a letter to President Reagan, Lewis wrote that "there should be no doubt that acidic air emissions are being transported through the atmosphere and over the U.S./Canadian border. That transboundary air pollution is causing serious environmental concern in both countries because of

the ecological, economic, and cultural value of the resources at risk."

Important step forward

Both envoys were appointed to their positions in March 1985. Their report is scheduled to be discussed during a March meeting between Reagan and Mulroney. The President called the report "an important step forward", but has not yet endorsed its recommendations.

Davis, in a letter to Mulroney, said, "Now that our own acid rain abatement program is being implemented, it is all the more important that our American friends show in some tangible way that they too are ready to take action to reduce transboundary pollution."

In March 1985, the Canadian gov-

ernment announced an emissions control program to reduce SO₂ emissions from 1980 levels 50 percent by 1994.

By recommending that the U.S. government share in funding demonstration projects with industry, the envoys said that commercial availability of more cost-effective control technologies will be accelerated.

Report states

The report states, "If the menu of control options were expanded, and if the new options were significantly cheaper yet highly efficient, it would be easier to formulate an acid rain control plan that would have broader public appeal."

The Clean Air Coalition called it "just another stall."

Continued on page 3

More generating units sold for leasing purposes

BARRINGTON, IL—Leveraged leases were popular with utilities over the last few months as several sold ownership interests in generating units to institutional investors.

Montana Power Company (MPC) sold its 30 percent share of the Colstrip-4 coal-fired unit for \$280 million. Oglethorpe Power Corp. (OPC) sold its 60 percent interest in the coal-fired Scherer-2 unit for \$395 million. And, in the first leveraged lease involving a nuclear facility, Public Service Co. of New Mexico (PSNM) sold its 10.2 percent interest in Palo Verde-1 for \$325 million.

All three utilities will now lease the plants back. Leases involving electric generating plants are attractive to some investors because they allow the buyers to take tax advantages with the rapid depreciation of the plants.

MPC received Montana Public Service Commission (MPSC) approval recently to go ahead with a plan to sell its portion of the Colstrip-4 coal-fired plant to a group of investors.

"This puts in place the mechanism for completing the leveraged lease," said utility spokesman Cort Freeman.

Montana Power's 30 percent share of the 700 MW unit's output will be bought by SGE Partners, a joint venture of GE Credit Corp. and Shell Oil, and Burnham Leasing Corp. for \$75 million in equity. The other \$205 million in debt will come from a group of 19 companies.

Montana Power will then sell the power in the wholesale market. In return, the utility guarantees the investors a return on their investment for the life of their 25-year lease, he said.

The utility has invested \$266 million in the unit, which is expected to be ready for commercial operation in April. Freeman explained that the purchasers will pay Montana Power

\$266 million and put \$14 million in a trust to ensure completion of the plant.

Freeman said the purchasers didn't want to be subject to state regulation. He stated that the MPSC ruling means the output of the unit will be regulated by the Federal Energy Regulatory Commission. If Montana Power decides to purchase some of the power, Freeman said the transactions will be subject to commission regulation.

The utility said it will use proceeds from the sale to retire outstanding debts.

Other owners

Other owners of the unit include Puget Sound Power & Light (25%), Washington Water Power Co. (15%), Portland General Electric (20%), and PacifiCorp (10%).

At the end of the 25-year lease, the utility has four options. Freeman pointed out the company can walk away; extend the lease; purchase its share of the unit; or, pay a fixed rental fee.

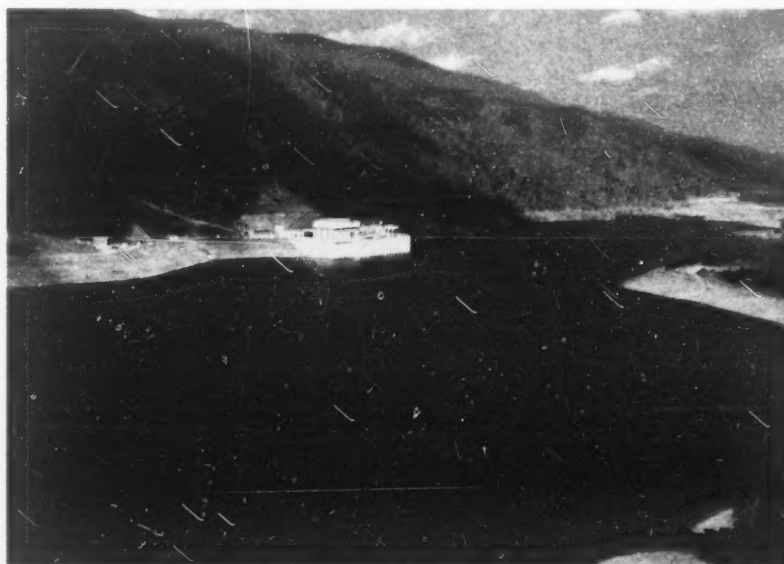
Oglethorpe Power, a power supply cooperative in Atlanta, said the leveraged lease of its interest in the Scherer plant "could generate tens of millions of dollars in savings for the corporation."

The cooperative signed a 27-year lease, which involves IBM, Ford Motor Credit Corp., Chrysler Financial Corp., and HEI Investment Corp.

According to OPC's corporate finance division manager Eugene Heckl, the co-op will use \$362 million to repay outstanding debts. About \$33 million will be placed in a reserve account to pay capital gains taxes and other costs associated with the transaction.

Heckl said the sale will help OPC reduce the rate impact of its owner-

Continued on page 11



Bath Station enters service

Virginia Power's \$1.7 billion Bath County Pumped Storage Station has begun generating electricity for the utility's 1.7 million customers. The facility is the world's largest hydroelectric pumped storage plant. Located in the mountains of western Virginia, the facility is capable of generating 2.1 million kilowatts. Virginia Power estimates the station will save its customers more than \$50 million annually in fuel charges. The Allegheny Power system companies have a 40 percent ownership in the facility.

New accounting rules proposed for phase-ins, disallowances

STAMFORD, CT—After two years of study, the Financial Accounting Standards Board (FASB) released a set of three amendments to the group's statement No. 71 that sets guidelines for certain utility accounting procedures.

The proposed amendments deal with accounting procedures for phase-in plans, abandonments, and disallowances of costs of newly completed plants.

According to the FASB, those specific areas were not addressed in FAS 71 when it was first issued in 1983.

Paul LePage, the FASB project manager who helped draw up the amendments, said the board wanted to create "realistic accounting for the events that are occurring in the industry."

The proposal says that the deferred costs of phase-in plans should be capitalized if three provisions are met. The plan has to be agreed to by the state regulators and it has to specify when recovery will occur. Also, all deferred amounts have to be recovered within 10 years.

Continued on page 11

PSE&G petitions for rate increase

● Public Service Electric and Gas Co. recently petitioned the New Jersey Board of Public Utilities for a 14.2 percent net rate increase, or \$633.6 million. The request calls for an increase in electric revenues of \$569 million, or 18.8 percent, and gas revenue increases of \$64 million, or 4.5 percent. According to PSE&G Executive Vice President-Finance, Everett L. Morris, the increase is needed to finish the Hope Creek Generating Station. Morris added that the station, which is 99 percent complete, represents the last construction project PSE&G will undertake during this century. Hope Creek is scheduled to load fuel in the first quarter of 1986 and should begin commercial operation by the second half of this year.

'85 was record year for U.S. nuclear power production

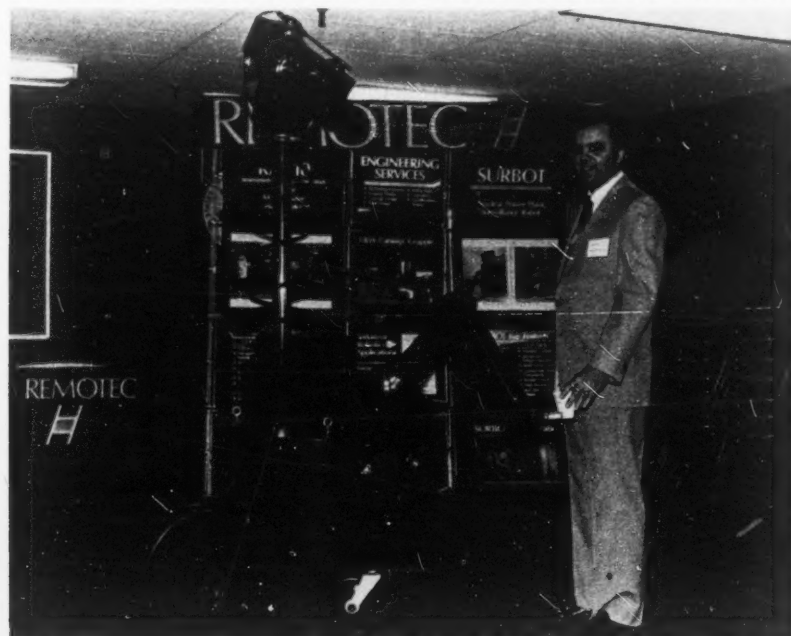
● The U.S. produced a record 380 billion kilowatt-hours of nuclear power during 1985, according to the Atomic Industrial Forum, Inc. (AIF). By September of last year, nuclear power accounted for 15.5 percent of the nation's supply and by the end of the third quarter production was almost 17 percent higher than

during the same period in 1984. As of Dec. 1985, 97 U.S. plants were in operation, with 31 units still under construction. Of those 31 units, 26 are scheduled for service by 1990 and five have uncertain completion dates. AIF reports that for the first half of 1985, the forced outage rate dropped to 9.1 percent, the lowest level in history. By Sept. 1985 the yearly average of automatic "scrams" (rapid shutdowns caused by mechanical failure) fell to 3.7 per unit, down from 4.4 in 1984 and 6 in 1980. Last year also marked the completion of Gulf States Utilities Co.'s River Bend-1 plant. Taking six years to build, AIF noted it was the third U.S. plant since 1983 to be finished in less than 80 months. Nuclear power cost more than power produced from coal, according to AIF. Coal-fired electricity dropped from 3.5 cents to 3.4 cents per kWh, while the cost of a kilowatt-hour of nuclear electricity rose from 3.5 cents to 4.1 cents.

Construction decline expected by public utilities

● Construction by investor-owned public utilities is expected to decline through the end of this decade, according to a forecast by Irving Trust Co. The firm projects that the industry will have spent more than \$25.8 billion on construction projects in 1985, \$10.2 billion of which was externally financed. By 1989, construction expenditures are expected to total less than \$12 billion.

NRC holds robot demonstration



"SURBOT", a mobile surveillance robot designed to help cut the radiation exposure of workers in nuclear power plants, hands a cup to an attendee of the robot's demonstration in November. The robot was built under a contract from the Nuclear Regulatory Commission for about \$300,000. According to the NRC, SURBOT has three television cameras (one in color) that can scan equipment in high radiation areas. Power comes from a control console and a flexible 150-ft cable controlled by a reel fastened to the base of the robot. It also is equipped with a variety of sensors to take measurements of radiation, temperature and humidity. The robot's single arm can open or close valves, pick up debris and operate power tools. Demonstration testing of SURBOT in a commercial nuclear plant is scheduled for sometime early this year.

State Supreme Court upholds investment rate recovery

● The Washington State Supreme Court affirmed an order of the Washington Utilities and Transportation Commission to allow Puget Sound Power & Light Co. to recover its investment in the abandoned Pebble Springs Nuclear Project. Puget Power officially abandoned its 23.5 percent interest in Pebble Springs in 1982. The utility invested a net \$47.7 million, which the commission held was recoverable in rates over a ten year period. The State Supreme Court's opinion upheld the lawfulness of rate recovery of abandoned plant costs and rejected the argument that such recovery was precluded by the "used and useful" language of the Washington statutes relating to ratemaking for electric utilities. Puget Power also is recovering its \$81 million net investment in the Skagit/Hanford Nuclear Project, abandoned in 1983. Puget Power said it is unclear whether opponents of the Skagit/Hanford recovery will continue to press an appeal.

HECo's rate increase request denied

● The Hawaii Public Utilities Commission denied a 3.1 percent, or \$16.6 million, rate increase requested by Hawaiian Electric Co. The utility asked for a 4.4 percent increase in Aug. 1984 for rising labor costs, material and capital, said vice president Harwood D. Williamson. Utility spokesman Doug Carlson expressed the utility's disappointment with the PUC's decision, but said HECo does not plan to appeal and will not be in any financial trouble without the increase. The company has not been granted an increase in rates since September 1983. Currently, HECo's customers are paying 7 percent less for electricity than when the request was originally filed.

PECO can build Limerick 2

● Philadelphia Electric Company will proceed with plans to build the 1,055 MW Limerick 2 nuclear plant. The utility agreed to charge ratepayers no more than the \$3.197 billion the utility says will take to complete the 31 percent-finished unit. By a 2-1 vote, the Pennsylvania Public Utilities Commission said in December that any expenditures over the amount of the cost cap can not be recovered through ratepayers. Also, the commission said that if the capacity factor of Limerick 2 drops below 60 percent, Philadelphia Electric will not be able to charge ratepayers for the costs of replacement energy. The utility has invested about \$897 million in the unit, which is 30 percent complete. Work was halted on the unit in 1982 after the PUC said that construction of two units at the same time was not financially feasible. Limerick 1 is expected to enter commercial operation sometime early this year. PUC Commissioner Bill Shane, the lone dissenter, said, "PECO's management is driving the economy of South-eastern Pennsylvania into decline because of its obdurate commitment to nuclear power, regardless of cost. The commission could have put a stop to this, but it has refused to do so. My only hope is that the courts will reverse this decision."

Palo Verde 2 licensed for low power testing

● Owners of the Palo Verde nuclear plant were issued a license in December by the Nuclear Regulatory Commission to load fuel and conduct low power testing of Unit 2. At full power, the pressurized water reactor will be capable of generating 1,270 MW. Owners of the unit are Arizona Public Service Co., the Salt River Agricultural Improvement and Power District, Southern California Edison Co., El Paso Electric Co., Public Service Co. of New Mexico, Los Angeles Dept. of Water and Power, and Southern California Public Power Authority. Unit 1 was licensed for full power operation June 1, 1985.

C&SOE takes \$66M write-off for Zimmer

COLUMBUS, OHIO—Columbus and Southern Ohio Electric Co. (C&SOE), a subsidiary of American Electric Power, said it will take a \$66 million write-off for its investment in the Zimmer plant, as a result of a settlement agreement approved in November 1985.

C&SOE Chairman W.S. White, Jr. stated that the write-off would reduce American Electric Power's 1985

earnings by approximately 35 cents per share. However, White said in a recent report to shareholders that a reduction in the common stock dividend is not anticipated.

The agreement provides for the disallowance, for future ratemaking purposes, of a portion of the investment in Zimmer by its owners, C&SOE, Cincinnati Gas & Electric Co., and The Dayton Power and Light Co.

In This Issue

Editorial	4
Calendar	7
Coal-water fuels have lost favor with utilities due to the plunging price of oil.G	17
The first tidal power plant in North America has completed a successful first year of operation.G	20
Reduced mechanical stresses on HV switches for longer, trouble-free operation is the goal of proposed new standards.T/D	24
New Products	26
New Literature	30
Personnel	32
Readers' Service	33
Regulatory Review	35
Management Methods	38

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Rate shock continues to impact utilities, says report

CLEVELAND—According to a recent survey of financial and accounting developments in the utility industry, rate shock continues to have the greatest potential impact on utilities, regulators and consumers.

Price Waterhouse, which conducted the survey of 65 leading investor-owned utilities, said the companies are concerned about rate phase-in plans, mandatory construction and management audits of recently completed generating units, and continued construction delays, property losses and potential plant abandonments.

Paul R. Bjorn, chairman of the firm's Public Utilities Industry Services Group, stated, "Financial reporting and accounting practices of public utilities are under critical review by the Financial Accounting Standards Board (FASB) due to many issues currently facing public utilities." (see p.1 story)

In January of 1985, the FASB decided to look into the Statement of Financial Accounting Standards No. 71 (FAS 71) in order to determine if the existing accounting rules are effective in the current utility climate. Throughout last year, the FASB has been addressing FAS 71.

Economic realities

He said the FASB is principally concerned whether utilities' financial statements reflect the economic realities of the utility industry.

Bjorn pointed out that the survey shows that 18 of the 65 utilities either adopted or proposed rate phase-in plans in 1984 to combat rate shock. FAS 71 offers no guidance for the accounting treatment of phase-ins.

Also, pointed out the survey, there is an increased propensity of regulators to require mandatory construction and management audits of recently completed generating units. As a result regulators may partially or totally disallow construction costs from rate base and/or preclude the cost of service recovery of depreciation or operating expenses.

The survey found that 23 utilities disclosed potential or actual disallowances in 1984, compared to 14 in 1983. Twelve of the companies surveyed reported that prudence audits were either planned or threatened, while four utilities said audits were either

PROPERTY LOSSES AND POTENTIAL PLANT ABANDONMENTS			
	1984	1983	1982
Property losses:			
number of companies reporting nuclear losses and non-nuclear losses, if applicable	31	31	30
number of companies reporting only non-nuclear losses	3	2	7
number of nuclear property losses	45	49	48
number of non-nuclear property losses	12	13	15
Potential plant abandonments:			
number of companies reporting possible plant abandonments	18	18	5
number of nuclear plants involved	10	11	5
number of non-nuclear plants involved	1	1	1
Source: Price Waterhouse			

CONSTRUCTION DELAYS			
	1984	1983	1982
Number of companies reporting delays	24	31	28
Number of nuclear plants involved	14	17	20
Number of non-nuclear plants or projects involved	12	11	14
Source: Price Waterhouse			

POTENTIAL ABANDONMENTS	
Company	Generating unit(s)
American Electric Power Company, Inc.	Poston 1 & 2, Zimmer
Central Hudson Gas & Electric Corporation	Nine Mile Point 2
The Cincinnati Gas & Electric Company	Zimmer
The Cleveland Electric Illuminating Company	Perry 2
The Dayton Power and Light Company	Zimmer
Duquesne Light Company	Perry 2
General Public Utilities Corporation	Three Mile Island 2
Long Island Lighting Company	Nine Mile Point 2, Shoreham
Middle South Utilities, Inc.	Grand Gulf 2
New England Electric System	Millstone 3, Seabrook 1
New York State Electric & Gas Corporation	Nine Mile Point 2
Niagara Mohawk Power Corporation	Nine Mile Point 2
Northeast Utilities	Seabrook 1
Ohio Edison Company	Perry 2
PacifiCorp	Washington Public Power System 3
Philadelphia Electric Company	Limerick 2
Rochester Gas and Electric Corporation	Nine Mile Point 2
The Toledo Edison Company	Perry 2
Source: Price Waterhouse	

scheduled or in process.

The FASB is studying whether amounts identified as being disallowed should be charged against results of operations in the current period or over the life of the generating unit.

Could be dramatic

Price Waterhouse noted that the

results could be dramatic if utilities with rate moderation plans or partial disallowances are precluded from applying FAS 71.

"These utilities would have to report financial position and results of operations in the same manner as non-regulated businesses," said the firm in a survey report. "As a result, the comparability of financial report-

ing within the public utility industry would be reduced."

Bjorn pointed out that survey results show continuing construction delays by many companies as well as property losses and potential plant abandonments.

Uncertainties

"The reasons cited in our survey," he stated, "were uncertainties about future nuclear power, declining growth rates, and customer conservation."

Of the 65 companies queried, 24 reported construction delays, 34 reported property losses aggregating \$12 billion, and 13 disclosed situations which could lead to potential abandonment of units under construction (See charts). The Price Waterhouse report said potential abandonments disclosed in 1984 were about \$14 billion.

Reasons for the delays

The main reasons noted for the delays included inadequate rate relief and corresponding lack of funds, delays in project approvals by applicable regulatory agencies, reductions in projected sales growth, higher construction quality requirements and, in the case of alternative fuels, lack of government grants and loan guarantees.

Price Waterhouse said the principal accounting question associated with construction delays is whether, and for how long, Allowance for Funds Used During Construction (AFUDC) and other costs should be capitalized. Of the companies reporting delays, 12 indicated that accrual of AFUDC is continuing.

Also, the survey discovered that 23 companies reported in excess of 50 percent of net income available for common stockholders attributable to AFUDC, a decline from 30 companies in 1983.

Property losses

Of the 57 property losses reported in 1984, the survey found that 31 were fully recovered through rates, eight partially recovered through rates, one was disallowed, 12 remained undecided, three had no discussion of the rate treatment, and two were written off without a request for recovery.

Acid rain recommendations . . . from page 1

Spokeswoman Elizabeth Agle said the administration should call for immediate reductions in plant emissions.

"We're very dismayed that it's not a call for actual reductions," she told *EL&P*, "It's not enough to say acid rain is a problem."

Edison Electric Institute spokeswoman Susan Wallace said the industry supports the clean coal technology aspect of the recommendations. She pointed out that through the Electric Power Research Institute, electric utilities already have spent \$500 million on clean coal technology development. She added that the industry has committed to spending \$589 million more by the end of 1989.

Specifically, the report calls for the U.S. government to provide half the funding (\$2.5 billion) for projects that industry recommends and is prepared to contribute the other half of funding.

It states that the government should fund the projects that have the potential for the largest emissions reductions. If projects are similar, the

ones that can reduce emissions the cheapest should be picked first. Also, the report recommends giving more consideration to projects that demonstrate retrofit technologies applicable to the largest number of existing sources, especially ones that contribute to transboundary air pollution.

According to the joint report, special consideration should be given to technologies that can be applied to facilities dependent on the use of high-sulfur coal.

Panel to be created

Headed by a senior Cabinet official, the envoys recommend creation of a panel to oversee the program and select the projects to be funded. According to the report, the Environmental Protection Agency and the U.S. Dept. of Energy will provide technical expertise. Other panel members will be taken from the State Dept. and state governments. Canada also will be invited to send a panel member.

The report also recommends that methods to measure dry deposition be

developed. And, that research should be accelerated to investigate the link between forest and tree decline and acid rain.

In his letter, Lewis said there is significant uncertainty regarding the extent and nature of acid rain. "We are unsure of the size and significance of the ecological and economic losses now being experienced," he wrote.

About one-half of the acid rain affecting Eastern Canada originates in the U.S., says the report. "Overall," cited the report, "the U.S. exports about four times as much SO₂ as it imports from Canada each year."

The envoys state that natural emissions of sulfur and nitrogen compounds in the U.S. are relatively in-

significant contributors to acid rain. "Clearly," the report finds, "man-made emissions of sulfur and nitrogen compounds contribute far more to acid rain in the U.S. than natural sources."

It said the major sources of U.S. sulfur emissions are coal-fired electric plants, industrial boilers and processes, and ore smelting.

NOx emissions come from vehicles and industrial fuel combustion, found the report.

However, the report points out that U.S. sulfur emissions are declining. Electric utility SO₂ emissions dropped 19 percent between 1973 and 1983, and industrial emissions fell by 46 percent.

DP&L announces planned restructuring

DAYTON, OH—Dayton Power & Light Company (DP&L) announced planned restructuring in January that will result in the formation of a new holding company.

DPL Inc. would become the parent of DP&L. The utility said the planned reorganization will take place by the end of April, if approved by stock-

holders at an April 10 meeting.

DP&L President and Chief Executive Officer Peter H. Forster said, "The new holding company structure will provide long term advantages to Dayton Power & Light's shareholders, customers and employees through increased organizational and financial flexibility."

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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NRC takes another look at B&W reactor safety

Don Minner
Associate Editor

WASHINGTON, D.C.—Several recent events have moved the Nuclear Regulatory Commission to begin a reassessment of the long term safety of nuclear reactors designed by Babcock & Wilcox Company (B&W).

The six utilities operating B&W reactors in the U.S. were notified in a Jan. 24 letter from NRC Acting Executive Director for Operations Victor Stello that the reassessment work will begin immediately. The NRC staff said the reactors can operate safely in the interim.

Stello said he asked the B&W Owners Group to take a leadership role in developing with the NRC the plans for re-examination. The NRC hopes to have its work completed in 1986.

According to the NRC, B&W plants are more sensitive in their response to operational events than other pressurized water reactors. Even though the utilities operating the units have been making modifications, the NRC noted that the number and complex-

ity of events has not decreased. The staff said it recognizes that significant differences exist among the B&W plants that need to be considered.

In its reassessment, the NRC said "the staff will determine whether the present set of requirements for B&W reactors are appropriate for the long term and lead to a level of safety at these reactors that is comparable to other pressurized water reactors."

Jim Taylor, manager of licensing services at B&W's Nuclear Power Division said, "In light of the external pressures placed on the NRC, the request of a re-assessment was probably appropriate."

He pointed out that the B&W Owners Group presented a report to the NRC on Feb. 5 that was favorably received regarding a recent re-direction of some of its activities aimed at improving performance.

B&W reactors were examined after the Three Mile Island-2 accident in 1979, according to NRC spokesman John Kopeck.

Continued on page 6



Sacramento Municipal Utility District's 918 MW Rancho Seco-1 nuclear plant is the subject of a special investigation by the Nuclear Regulatory Commission. Electrical power to the Integrated Control System was lost on Dec. 26. The NRC said it is one in a recent series of events that have caused the commission to examine the safety of Babcock & Wilcox-designed reactors.

PSI decides to write off most of its \$2.7B Marble Hill investment

PLAINFILED, IN—Public Service Indiana's Board of Directors announced in late January that "a substantial portion" of the utility's \$2.7 billion investment in the cancelled Marble Hill nuclear plant will be written off.

The board voted to omit PSI's common stock dividend for the next three years and said the preferred stock dividend would not be paid out in the first quarter.

PSI also said it had accepted a negotiated rate settlement with the state's Utility Consumer Counselor

for an 8.2 percent, or \$68.2 million rate increase. A five percent emergency surcharge in effect since March 1984 would become permanent. The company had asked for a 9.2 percent rate increase in Feb. 1985.

Acceptable alternative

"It's not what we had ideally hoped for," expressed utility spokeswoman Chris Combs, "but it's the most acceptable alternative."

The negotiated settlement still must be approved by the Indiana Public Service Commission.

When cancelled Nov. 14, 1984, almost \$2.7 billion had been spent on the two unit plant which was 50 percent complete.

After the Indiana Supreme Court ruled last November (See Jan. EL&P, p.1) that Northern Indiana Public Service Co. could not recover any of its \$191 million investment in its cancelled Bailly plant, PSI decided not to attempt to recover the full costs of Marble Hill.

Combs admitted the state supreme court's decision to rule out amortization of Bailly "had quite a bit of influence" on PSI's decision to write off a large amount of the plant.

Hugh A. Barker, PSI chairman, said, "The decision to write off a sub-

stantial portion of the Marble Hill investment and accept the settlement came after much study. But in light of recent court action and other factors, we had to accept a way to ensure reliable service to our current customers and those people and companies who consider locating here."

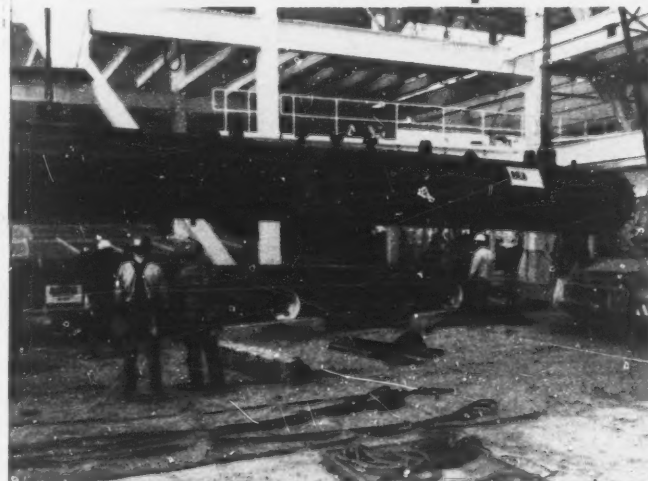
Amount not known

The amount of the write-off will not be known until a review is done by regulatory authorities, stated the utility.

Terms of the settlement agreement call for the utility to restrict its capital expenditures over the next three years to the \$285.1 million already

Continued on page 7

st CFB boiler set in place



The world's most utility-scale circulating fluidized bed (CFB) boiler, supplied by Pyropower Corp., was set in place in January at Colorado-UTE Electric Association's mothballed 36 MW Nucla station. When completed in 1987, Pyropower said the facility will have a post-retrofit capacity of 110 MW. The Pyropower CFB boiler will generate 925,000 lbs. of steam per hour, making it the world's largest CFB boiler.

Revenue, earnings increase for most electric utilities in '85

Don Minner
Associate Editor

BARRINGTON, IL—Increased electricity sales, rate relief and weather-related demand were all factors that improved the 1985 operating and earnings performances of most electric utilities included in a recent survey of year-end financial statements.

EL&P looked at 1985 operating revenue and earnings per share data from 29 early reporting investor-owned utilities. (See chart on p.12)

Rate increases last year helped boost revenues at Detroit Edison (6.3%), Central South West Corp. (5.2%), Northern States Power (0.7%), Carolina Power & Light (4.3%), FPL Group (10.3%) and

Montana Power (15.3%).

Strong sales

Electricity sales to all classes of customers were strong in 1985, according to the sampling.

Southern Co. President Edward Addison called the year one of the company's "strongest years ever." Operating revenues at the utility were up 11.3 percent and earnings increased 6.7 percent.

Commercial electric sales at Southern climbed 8.3 percent, while industrial energy use rose 2.0 percent and residential sales went up 2.0 percent.

At Dominion Resources, kilowatt-hour sales increased 6.2 percent last year and sales were up 2.2 percent at

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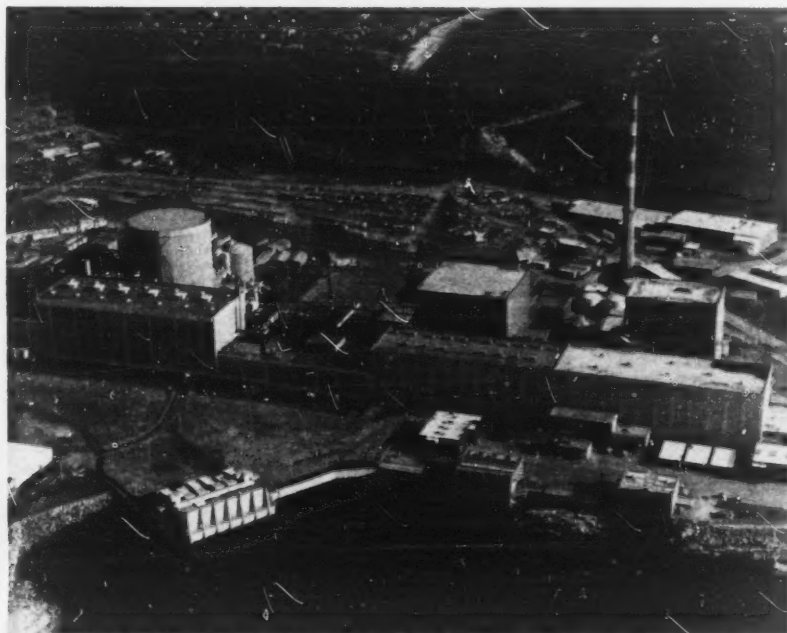
Niagara Mohawk delays fuel loading at Nine Mile Two project

● Nuclear fuel loading at the 1,084 MW Nine Mile Two nuclear project will be delayed for up to ten weeks, according to Niagara Mohawk Power Corp. The delay will probably push back the original Oct. 1986 commercial operation date said the company. The cost of completing the project is estimated at \$5.35 billion, although Niagara Mohawk said the delay would add a minimum of \$60 million a month. Under the terms of a proposed prudency settlement agreement now pending, and because of a "cost cap" of \$5.4 billion set for the project in July 1984 by the state public service commission, stockholders would be expected to cover the additional costs caused by the delay. Niagara Mohawk, a 41 percent owner of the project, would cover \$25 million per month of the total added costs. Other owners of the project are New York State Electric & Gas Corp. (18%), Long Island Lighting Co. (18%), Rochester Gas and Electric Corp. (14%) and Central Hudson Gas and Electric Corp. (9%).

PSE&G holding company formed

● The New Jersey Board of Public Utilities recently approved the formation of a holding company for Public Service Electric and Gas Co. (PSE&G). Effective May 1, Public Service Enterprise Group Inc. will be the parent of PSE&G and two existing subsidiaries, Community Energy Alternatives Inc. (CEA) and Public Service Resources Corp. an investment subsidiary. CEA will develop alternate energy projects and cogeneration projects.

NRC grants Millstone license



Northeast Utilities' Millstone 3 nuclear unit was issued a full-power license by the Nuclear Regulatory Commission Jan. 29. The 1,150 MW Westinghouse pressurized water reactor plant is scheduled for commercial operation May 1. Construction started on the unit in August 1974 and was completed for approximately \$3.8 billion, said a utility spokesman. Millstone 1 (660 MW) entered commercial operation November 1970 and Millstone 2 (870 MW) entered service December 1975.

In This Issue

Editorial	4
Calendar	13
The reputation of Supercritical boiler designs is being rehabilitated.G	17
Frequency synthesized two-way radio systems are providing consumers with new levels of communications and operational flexibility.T/D	24
New Products	30
Readers' Service	31
Bulletin Board	35
Personnel	39
Regulatory Review	40
Management Methods	42

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Idaho Power buys eastern Oregon service areas

● The Idaho Public Utility Commission has approved a plan by Idaho Power Co. to purchase eastern Oregon territories, now served by CP National Corp., for approximately \$65 million, according to commissioner Gene Maudlin. The utility will provide service to CP National customers in Union, Baker, Grant and Harney counties. Idaho Power filed a rate increase request last year for its existing territory and is expected to file a revised proposal based on its enlarged service area. The company will also file a plan to address rate issues associated with the purchase.

REA guarantees Oglethorpe Power \$721M for Vogtle Plant

● Oglethorpe Power Corp. has received a \$721 million loan guarantee from the Rural Electrification Administration (REA) to cover its portion of the Vogtle plant cost increase announced last August. "We realized last year that we did not have sufficient loan funds to complete the Vogtle project under the new cost estimate," said F.F. Stacy, general manager. "This commitment from the REA helps ensure that our financial requirement for Plant Vogtle will be met." Oglethorpe has invested about \$1.7 billion in the \$8.4 billion project so far and said it expects to invest a total \$2.7 billion by the time the plant begins commercial operation in 1987.

NSP to ask for vote on stock split

● Northern States Power Company's (NSP) Board of Directors will ask shareholders to vote for a two-for-one common stock split later this year. The split would increase the number of authorized shares and change the par value of the common stock from \$5 to \$2.50. "We want as many individuals in our service territory as possible to own NSP stock," said Don McCarthy, chairman and chief executive officer. Common stock has been selling in the \$50 range, compared with about \$25 a share average for investor owned electric utilities, according to NSP.

TMI-1 back in operation after shut down

● TMI-1 went back into operation the first week of February, after a one week shut down in late January for repairs to a steam line link on the plant's secondary side. According to GPU Nuclear, the steam line link was causing a loss of about 25 MW in the plant. The plant had been operating successfully for three months before the shut down.

Palo Verde 2 and 3 scheduled for operation in '86 and '87

● Arizona Nuclear Power Project (ANPP) has announced that Palo Verde Units 2 and 3 are scheduled for commercial operation during the third quarters of 1986 and 1987, respectively. The 1,270 megawatt plants were originally scheduled for operation during mid-1986 and mid-1987. According to Ed Van Brunt, ANPP executive vice president, the main reason for the delay was that Unit 2's operating license was received later than expected. Unit 2 finished fuel loading in Dec. 1985 and construction on Unit 3 is about 99% complete, with fuel loading scheduled for the first quarter of 1987.

PP&L goes five years without job-related fatality

● Pennsylvania Power & Light Co. (PP&L) has operated a record five years without a job-related fatality, according to DeForrest S. Bast, director of safety and health. "The company has had five separate years without a fatality before, but never in a row like this," said Bast. He attributed the accomplishment to company systems that safeguard workers from accidental energizing of electrical circuits, use of protective equipment and safety consciousness in employees.

Kaiser/Lummus Crest will study Chinese coal project

● A contract to study China's \$800 million coal gasification project near Beijing has been awarded to Kaiser Engineers and Constructors, Inc. and Lummus Crest Inc. The joint venture will study the technical and economic feasibility of a plant to be located at Yuxian in Hebei province. The plant will convert subbituminous coal, from mines not yet developed, into medium-BTU gas. The gas will be piped 240 kilometers to Beijing for domestic and industrial use. According to Kaiser, the plant will be designed to produce gas that is compatible with other coal gas currently being used in Beijing. Funded by the U.S. Trade and Development Program, the study is scheduled for completion in April.

Rehearing ordered on hydro question

● The full U.S. Court of Appeals for the District of Columbia vacated an October ruling by a three-judge panel of the court that said municipal power groups do have a "preference" in obtaining hydro plant licenses that are up for renewal. Acting on a petition for rehearing by the U.S. Justice Dept. and investor-owned utilities, the full court on Jan. 16 ordered a rehearing. Lawyers for both sides will file new briefs and prepare for more oral arguments. In October, the court panel reversed a Federal Energy Regulatory Commission decision and ordered the commission to give the license to operate the Merwin Dam in Washington state to a local municipal corporation. The dam had been operated for 50 years by Pacific Power & Light Company. The debate hinges on interpretation of the Federal Power Act of 1920 and whether it grants a preference to public power agencies in obtaining licenses that come up for renewal. In February, the House Energy and Commerce Committee approved a bill that would take away the preference for municipalities. The legislation would mean that investor-owned utilities and municipals would compete on an even basis. Similar legislation is pending in the Senate.

Revenue, earnings increase . . . from page 1

Utilicorp United, parent of Missouri Public Service.

Said Utilicorp, "Performance in 1985 was affected by a strong showing in electric sales to industrial customers, an indication of a healthy service area economy and an overall trend to increasing industrial usage in the metropolitan Kansas City service area."

Retail customer sales at Central and South West rose 2.5 percent over 1984 levels and Northern States Power's retail sales rose 2.6 percent last year. Energy sales were up 2.1 percent at Carolina Power & Light.

Total kilowatt-hour sales of electricity within Niagara Mohawk's ser-

vice area increased 6 percent in 1985, according to Senior Vice President of Finance and Accounting L. Wallace Cross.

Negative results at Orange & Rockland (O&R) were reported due to a change in accounting methods for the company's oil and gas subsidiary. O&R said improved economic conditions in its service territory resulted in a greater number of commercial customers in 1985. Also, retail sales rose 1.7 percent. Electric revenues at the company increased slightly to \$352 million last year, from \$349 in 1984.

KPL Gas Service noted that electric energy sales were slightly higher than in 1984 (0.9%), reflecting abnormally cold weather in the fourth quarter offset by an unusually cool summer season.

Weather played a part

Weather also played a part in Detroit Edison's electricity sales. Total kilowatt-hour sales went up 2.3 percent, but residential sales decreased for the year said the utility because of cooler summer weather. Detroit Edison's residential sales in the fourth quarter rose due to colder December temperatures.

Despite a sales decrease of 4.8 percent for 1985, Niagara Mohawk Pow-

er reported a 1.4 percent increase in earnings.

"A tight cost containment program and successful securities investment strategy have helped enable the company to post improved earnings for a fifth consecutive year," reported Minnesota Power Chairman and Chief Executive Jack F. Rowe.

Although Minnesota Power's revenues were down 1.1 percent last year, the company managed a 15.0 percent increase in earnings per share.

The 7.87 percent in earnings per share at United Illuminating is primarily due to increased sales, savings from several cash conservation meas-

Continued on page 12

FERC names acting chairman



Anthony G. Sousa, a two-term commissioner of the Federal Energy Regulatory Commission, was named acting chairman by President Reagan in February. Sousa, whose term expires Oct. 1988, was formerly a vice president and general counsel of the Hawaii Telephone Company. He also has served as an administrative law judge at the California Public Utilities Commission.

Contract signed for Calif. wind farm

SAN RAFAEL, CA—Howden Wind Parks, Inc. announced completion of its first major wind farm development in the Altamont Pass area of California.

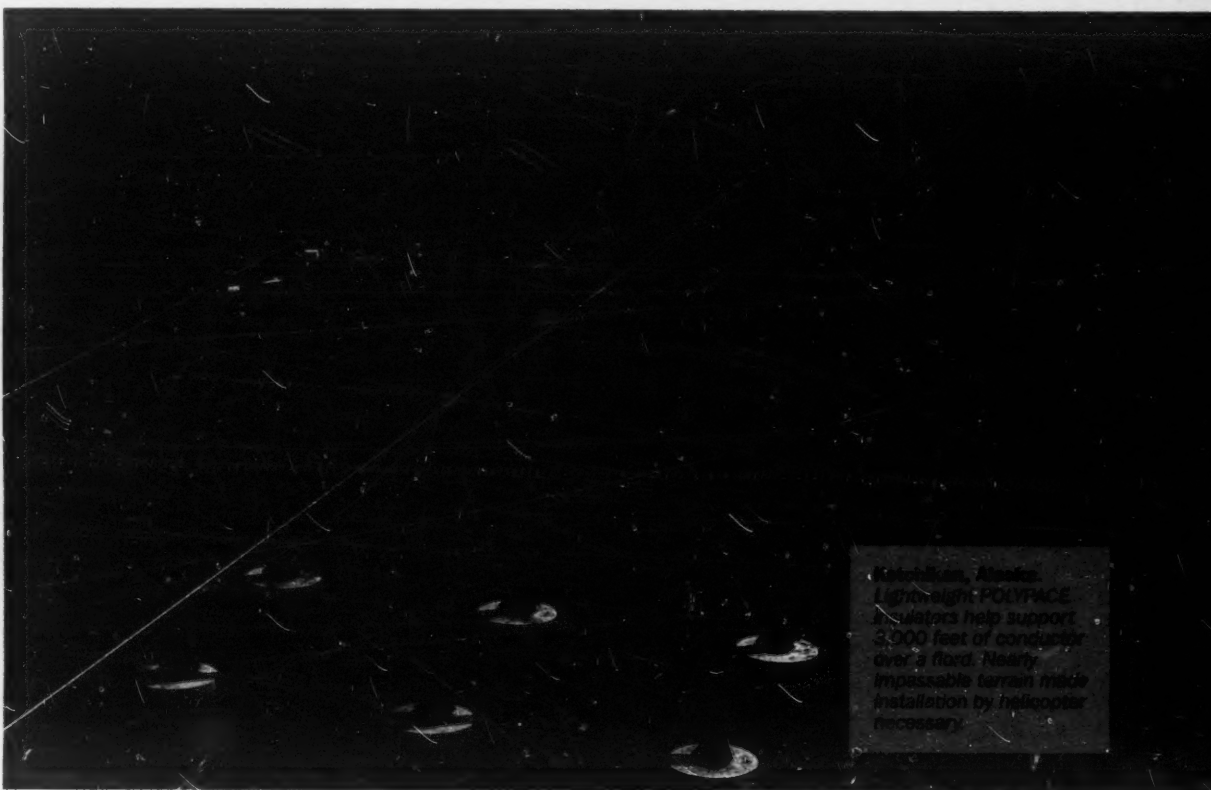
The subsidiary of the Scottish-based Howden Group said its 25 MW project, made up of seventy-five 330-kW wind turbine generators was sold to an unnamed institutional investor for \$48 million.

Demonstration machine

Howden has installed ten 60-kW machines and a demonstration wind turbine rated at 750-kW on the same site. Pacific Gas & Electric selected the demonstration machine as the reference design for a conceptual study of a 100 MW wind farm that is currently in progress.

During the past three years, Howden pointed out that approximately 1,000 MW of wind plant has been installed in California.

In Europe the use of wind turbine generators also is growing. Howden said projections indicate that wind power could provide ten percent of Europe's electricity by the turn of the century.



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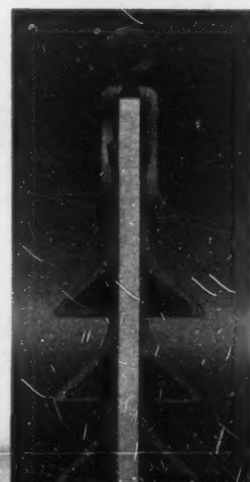
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Revenue, earnings increase . . . from page 11

ures and a greater amount of non-cash AFUDC. The company's auditors said they will qualify their opinion on United Illuminating's 1985 and 1984 financial statements due to uncertainties regarding the company's involvement in the Seabrook plant.

"Earnings were up because California Public Utilities Commission disallowances were less in 1985 than 1984," said Thomas A. Page, SDG&E president, chief executive officer and chairman.

Earnings per share rose 8.0 percent and SDG&E's operating revenues were up 7.3 percent. Page said the company "improved its financial health significantly" in 1985.

Montana Power's earnings were up so dramatically (155.1%) due to recognition of \$65 million in carrying charges accumulated during the peri-

od its Colstrip-3 coal plant was in service prior to a state commission ruling in August that allowed the money to be added to the electric rate base.

Harry B. Sargent, Jr., executive vice president and chief financial officer of AZP Group, parent to Arizona Public Service (APS), said his company's earnings increase (6.3%) reflected customer growth and strong sales for APS.

As for the bad news last year, Pennsylvania Power & Light senior vice president Charles E. Russoli blamed the utility's 14.1 percent drop in earnings on the state public utility commission's decision to grant \$121 million of a requested \$330 million rate increase.

Iowa Resource's slight dip in earnings (0.2%) was caused by mild weather and problems in Iowa's agribusiness economy, said company President and Chief Executive Officer Mark W. Putney.

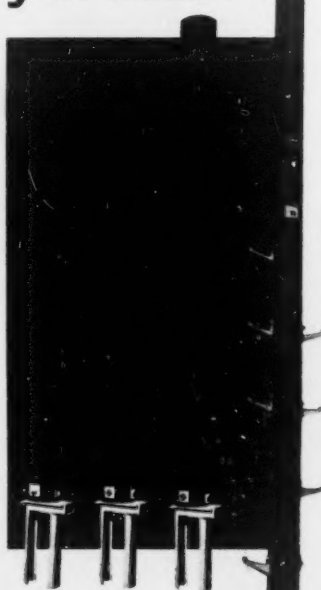
MDU Resources cited mild weather and the acquisitions of several portions of generating capacity as the reasons for the decline in the profitability of its electric business.

Weather caused gas sales to decline at Louisville Gas & Electric. Also, the utility said its earnings decrease (16.9%) resulted primarily from an increase in operating and maintenance expenses and a decline in gas billings.

Cooler weather also hit Philadelphia Electric, electric sales rose only 0.5 percent last year. Utility Vice President of Finance and Accounting Joseph F. Paquette stated, "The decline in earnings (5.2%) is directly related to the write-off in September 1985 of \$73 million of deferred fuel expenses which the Pennsylvania Public Utilities Commission ordered could not be recovered from PE's customers."

And, Middle South's problems with obtaining rate relief for its operating companies for Waterford-3 and Grand Gulf-1 had an impact on its earnings drop (29.7%). MSU's Chief Financial Officer R. Drake Keith said 1985 ended with adequate electric rate increases and the system should be in a position to improve its financial health.

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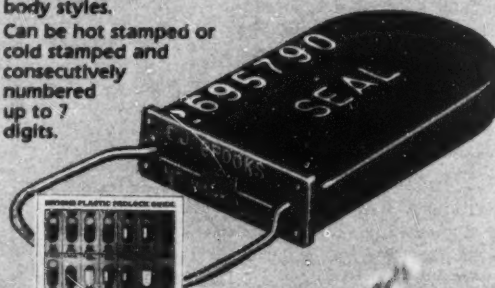
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SELECTED YEAR-END EARNINGS (thousands of dollars)

Company	Operating revenues 1985	Operating revenues 1984	% Change	Earnings per share 1985	Earnings per share 1984	% Change
AZP Group	1,174,000	995,000	+17.9	3.88	3.65	+6.3
Boston Edison	1,203,972	1,316,668	(-8.6)	3.34	3.12	+7.1
Carolina P&L	1,934,715	1,854,260	+4.3	3.96	3.81	+1.3
Central Hudson G&E	504,802	523,189	(-3.5)	4.67	4.43	+5.4
Central & South West	2,710,766	2,766,196	(-2.0)	3.61	3.43	+5.2
Detroit Edison	2,788,157	2,498,205	+11.6	2.33	2.20	+5.9
Dominion Resources	2,712,106	2,604,528	+4.1	3.60	3.46	+4.0
FPL Group	4,348,826	3,940,934	+10.3	3.11	2.82	+10.7
Florida Progress	1,853,100	1,384,200	+33.9	3.53	2.71	+30.3
Iowa Resources	341,305	325,851	+4.7	4.11	4.12	(-0.2)
Kansas P&L	1,354,128	1,480,182	(-8.5)	4.94	4.80	+2.9
Kentucky Utilities	536,039	530,904	+1.3	2.84	3.03	(-6.3)
Louisville G&E	675,202	676,296	(-0.2)	3.15	3.79	(-16.9)
MDU Resources	408,054	424,716	(-3.7)	2.87	3.02	(-5.0)
Middle South Util.	3,084,877	2,959,570	+4.2	2.01	2.86	(-29.7)
Minnesota Power	412,884	417,337	(-1.1)	4.67	4.06	+15.0
Montana Power	425,173	368,723	+15.3	5.23	2.05	+155.1
Niagara Mohawk	2,694,940	2,785,546	(-3.3)	2.88	2.84	+1.4
Northern States Pwr.	1,788,700	1,775,600	+0.7	5.93	5.18	+14.5
Orange & Rockland	523,521	537,985	(-2.7)	2.81	2.92	(-3.8)
Pa. Power & Lt.	1,976,502	1,562,782	+26.5	2.68	3.12	(-14.1)
Philadelphia Electric	3,013,704	2,981,017	+1.1	2.56	2.70	(-5.2)
Potomac Electric	1,315,699	1,197,534	+9.9	3.59	3.23	+11.1
Public Service E&G	4,409,054	4,196,124	+5.1	3.96	3.95	+0.3
St. Jos. P&L	77,281	76,779	+1.0	3.03	2.98	+1.7
San Diego G&E	1,738,702	1,620,701	+7.3	3.25	3.01	+8.0
Southern Co.	6,813,927	6,123,985	+11.3	3.20	3.00	+6.7
United Illuminating	514,936	509,470	+1.1	5.82	5.40	+7.8
Utilicorp United	243,150	234,251	+3.8	3.10	2.99	+3.7

Source: Company financial statements

Fusion research agreement signed

MUNICH, WEST GERMANY—An agreement was signed in January by the United States, Japan and the European Community to collaborate in research into advanced nuclear fusion through an information link between their experimental tokamak facilities.

Tokamak is an acronym taken from four Russian words to describe the magnetic fusion process, also known as controlled thermonuclear fusion, that combines hydrogen nuclei to produce helium.

Senior officials signed the agreement establishing the project, whose purpose is to develop nuclear fusion as a potential new power generating

source.

Tokamak facilities are located at Princeton, NJ; Naka-Machi, Japan; and Culham, United Kingdom.

IEA Executive Director Helga Steeg said, "Before we can produce power from nuclear fusion it will be necessary to develop suitable technology and to prove economic viability. This is an area of long-term research that is likely to remain experimental into the next century, and one therefore that must at its present stage be funded almost entirely on government funding."

She added that the agreement "represents a significant new step in international collaboration."



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Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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Government expects to recoup coal investment

Don Minner
Associate Editor

WASHINGTON, D.C.—Potential participants in the federal government's \$400 million Clean Coal Technology program were thrown a change-up in February, when the Dept. of Energy announced that it expected repayment for its contribution to planned demonstrations.

Controversy arose after DOE issued a Program Opportunity Notice (PON) Feb. 17 that conflicted with the view of Energy Secretary John S. Herrington. The PON is a notice explaining how to submit a proposal for federal assistance. Congress required that proposals be submitted to DOE by April 15 and that projects be selected by August 1.

The original PON stated that DOE would share in any revenues generated by the projects during their initial operation period.

However, testifying the next day before a Senate committee, Secretary Herrington said DOE's intent was to recover its money from a share of the project's profits during its commercial operation.

DOE spokesman Bob Porter told *EL&P* that the misunderstanding was corrected on Feb. 21 when DOE issued a modification to the PON stating that no revenue would be taken from the projects during their demonstration period. But, as previously stated, the government would expect to share in the profits—up to its investment—of the projects after commercial operation, and if the technology was ever sold or licensed.

"DOE believes that if the taxpayers are put at risk, they must be able to recoup their investment," he said.

According to the DOE budget proposal, the goal of the Clean Coal program is to provide financial assistance for the construction and operation of projects to demonstrate their feasibility for future commercial applications. Funding is being made available beginning in FY 1986 at a level of \$99.4 million. In 1987 and 1988, \$149.1 million will be made available. President Reagan also has the authority to provide an additional \$350 million to the program.

Many of those with an interest in the program were surprised to learn after reading the PON that it was not

a grant program.

At a conference on Clean Coal technology Feb. 19, National Coal Association (NCA) President Carl E. Bagge said Congress intended to provide incentives for industry to move quickly and effectively by providing innovative cost-sharing programs.

"The critical effort to demonstrate new ways to burn coal cleanly is being undermined by a new DOE plan to provide only loans, not cost-sharing grants," charged Bagge at the meeting.

Ben Yamagata, executive director

of the Clean Coal Technology Coalition, told *EL&P*, "We are still working under the impression that Congress intended it to be a grant program."

The coalition is an ad hoc group of more than 40 groups representing electric utilities, coal companies, suppliers, contractors, governments, and trade associations.

He said members were "concerned" to learn that it was not a grant program. Yamagata noted that with the change in the PON, DOE is moving in

Continued on page 9

SEGS II operating on SCE grid



Giant solar panels harness energy for the world's largest commercial solar electrical generating system, SEGS II, located in the Mohave desert, 70 miles northeast of Los Angeles. The 30 MW, \$95 million system, installed on Southern California Edison's energy grid Dec. 21, is currently in start-up mode and performing ahead of expectations, according to LUZ Engineering.

NEMA: electricity use to slow

BARRINGTON, IL—Electric utilities have cut back their estimates of growth in the demand for electricity to a 2.1 percent compound rate per year over the next decade according to the latest biennial survey conducted by the National Electrical Manufacturers Association. This is the lowest long-term growth rate projection since the NEMA biennial studies were started 20 years ago.

The 2.1 percent rate in the growth of electric energy use represents a 16 percent drop in growth expectations from NEMA's most recent previous survey in 1984. The growth rate projected in the 1984 survey was 2.5 percent.

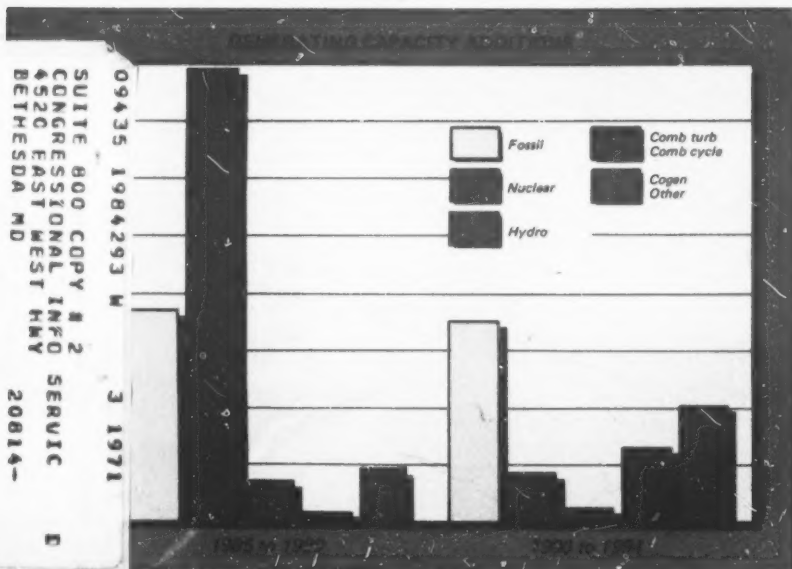
Summer demand growth similarly

was estimated at a 2.1 percent rate, to a total of 555 GW in 1994. This would result in a reserve generating margin of 23.8 percent in 1994 if all additions, retirements and adjustments currently planned are carried out.

For NEMA members, the suppliers of electrical apparatus for the electric utility industry, the grim outlook of two years ago has become even darker.

The report indicates generating reserve margins will continue to be adequate for the next several years, which means continuation of the drought for new generation system orders. It also shows reduced orders

Continued on page 10



Three to vie for Edison Medal

WASHINGTON, D.C.—Three investor-owned electric utility companies have been selected as nominees for the Edison Electric Institute's coveted Edison Medal. They are Florida Power & Light Co., Pacific Gas & Electric Co. and Pennsylvania Power & Light Co.

The three companies have been invited to submit formal presentations for final judging and selection of the 1986 award winner.

The companies were chosen by the Edison Award Review Committee, headed by *Electric Light & Power* Editor Robert A. Lincicome and including William Hayes, editor of *Electrical World*, and Lucien Smartt, editor of *Public Utilities Fortnightly*. The award, which includes the medal, a framed citation and a purse to go to the winning company's employee fund, will be presented to the winner at the EEI Annual Convention in San Francisco. The award will be presented on June 4.

Florida Power & Light Co. was nominated for "demonstrating its

commitment to quality in all aspects of company operations, as exemplified by development and company-wide implementation of its internal Quality Improvement Program, a program characterized this year by an internationally recognized quality consultant as 'the most outstanding quality improvement program of any company in the service industry in the United States,' and for its dedication to industry service by offering this unique program to other utilities, government agencies and other service organizations."

Pacific Gas & Electric Co. was nominated for "demonstrated leadership in its defense of First Amendment freedom of commercial speech, again recognized by the U.S. Supreme Court as a result of the company's action in opposing the California state commission's opinion that literature of advocacy groups opposing the utility's rate design and other policies be enclosed in the envelopes of customers' bills. When judicial re-

Continued on page 8

Midwest utilities to buy Canadian electricity

● Six Upper Midwest utilities have signed a memorandum of understanding to purchase 550 MW of electricity from the Manitoba Hydro-Electric Board beginning 1996 through 2012. The group, called the Upper Mississippi Power Group, consists of Northern States Power Co., United Power Association, Otter Tail Power Co., The Southern Minnesota Municipal Power Agency, Interstate Power Co. and Dairyland Power Cooperative. The agreement is contingent upon the Canadian utility building a power line from the Winnipeg area to the U.S. border and the American utilities building a power line from that point to their service areas. The Upper Mississippi Power Group is expected to sign a power purchase agreement by this summer.

Con Ed proposes common equity reduction

● Consolidated Edison is awaiting the New York State Public Service Commission's decision on its proposal to reduce its common stockholder equity by about \$500 million. According to the company, the proposal stems from a PSC ruling last November that Con Edison's common equity, currently about 53.5 percent of its capital structure, should be lowered and that the company should have an "equity ratio" of no more than 50 percent. In its PSC filing, Con Edison proposed: 1) Repurchase and retirement of an additional \$200 million of common stock, and 2) transfer of \$300 million of common equity from the company's capital structure to a new, wholly owned, non-regulated subsidiary.

Cooling pond at HL&P's Cedar Bayou Station becomes wildlife refuge



The cooling pond of Houston Lighting & Power Co.'s Cedar Bayou Electric Generating Station, located 30 miles east of Houston, has become a refuge for rare species of birds. HL&P owns 4,000 acres of coastal marsh, including the 2,600-acre cooling pond where the birds find warm, food-filled water discharged by the generating station. The pond, which is closed to the general public, has become "...one of the finest birding areas on the upper Texas Gulf Coast," according to Frank Schlicht, a manager in HL&P's Environmental Protection Department.

In This Issue

Editorial	4
Guidelines for labor negotiations are offered by the director of a Chicago-based labor research organization.	8
Calendar	15
Arkansas Power & Light saved about \$225,000 and the loss of a substation by using a unique process to reconstruct a 100-year-old storm drain. T/D ..	22
Productivity improvements of 10% and better work-order management results from incorporation of new software at Minnesota Power & Light Co. G ..	29
Readers' Service	33
New Products	35
New Literature	38
Personnel	42
Regulatory Review	44
Management Methods	46

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

PGE forms new holding company

● Portland General Electric Co. has become a wholly owned subsidiary of its new holding company, Portland General Corporation. Three of PGE's subsidiaries, Western EnerTech, Columbia Willamette Development and Columbia Willamette Financial Group, were transferred to Portland General Corp., along with PGE's minority interest in Synektron and its limited partnership interests in Montgomery Ventures and Oregon Graduate Center Lands.

Niagara Mohawk's costs increase for Nine Mile-2

● Niagara Mohawk Power Corp.'s latest cost estimate for the Nine Mile Two nuclear plant is \$5.526 billion. The estimate, which includes construction costs of \$3.827 billion and financing costs of \$1.699 billion, is based on the remaining work that needs to be done to get the plant into commercial operation by Jan. 1987. Owning 41 percent of the project, Niagara Mohawk said its share of the total estimate is about \$2.287 billion. In January, the utility had announced a delay in fuel loading and estimated the project completion cost at \$5.35 billion.

Westinghouse waste system marketed in Japan

● Westinghouse Electric Corp.'s waste technology division has given Ishikawajima-Harima Heavy Industries Co., Ltd., (IHI), exclusive marketing rights in Japan for its low-level radioactive waste storage and disposal system. The system is designed to accommodate most low-level radioactive waste packages and can be used for both interim and long-term waste storage. IHI plans to incorporate the system in its upcoming Shimokita and Horonobe waste projects and on other utility and government-related projects, according to Makio Amano, IHI's managing director and general manager of energy plants.

EPA says Hawaii complies with clean air standards

● The Environmental Protection Agency (EPA) has determined that Hawaii is in statewide compliance with the air quality standards of the federal Clean Air Act. The EPA decision lifted a ban on construction of major generating units at both Kahe and Kahuli, however Hawaiian Electric Co. Vice President of Engineering Richard O'Connell said there are no plans for installation of any major units at these locations in the near future.

Wisconsin Electric applies for holding company

● Wisconsin Electric Power Co., the first utility in the state to file an application to form a holding company, is awaiting approval from the Wisconsin Public Service Commission. If approved, Wisconsin Energy Corp. will become the new parent company of Wisconsin Electric, Wisconsin Natural Gas Co. and several non-utility subsidiaries. The utility expects all approvals on the filing to be received by the end of the year.

Independent audit conducted at Clinton Power Station

● An independent audit was recently conducted at Illinois Power Company's Clinton Power Station. Three firms, Theodore Barry & Associates, Ebasco Services, Inc. and Burns and Roe, Inc., audited top level management, procurement and construction, and quality assurance. All three found that management performance was generally reasonable. Another audit, conducted by Touche Ross and Co. and the Neilsen-Wurster Group, generally agreed with the other reports, except on one point. The two firms, hired by the Illinois Commerce Commission, contend that a portion of the cost associated with stop work actions issued in 1982 was unreasonable. The company believes its management of the Clinton Power Station was satisfactory and that cost disallowances are not appropriate.

Westinghouse opens research facility

● Westinghouse Electric Corp. has opened a \$2 million facility at its Research & Development Center in Pittsburgh. The float-zone research is aimed at production of high-quality single-crystal silicon for both advanced power semiconductor devices and specialty integrated circuits. The Electric Power Research Institute, the Defense Advanced Research Projects Agency, the U.S. Army and the U.S. Air Force are all planning to sponsor research at the facility, which is expected to be fully operational this month, according to Westinghouse.

Washington Public Power approves \$2.5M settlement

● The Executive Board of the Washington Public Power Supply System today approved a \$2.5 million settlement of a lawsuit against the Howard P. Foley Co. The suit, filed in August 1983, alleged Foley had conspired with other defendants to rig bids and fix prices for work done on the Supply System's Nuclear Projects 1 and 4 at Hanford. Foley, as part of the joint venture of Foley, Wismer and Becker, was awarded the main electrical contracts on projects 1 and 4 in 1978. The Supply System will receive 90 percent of the settlement and Kansas Power & Light, a partner in the suit, will receive 10 percent. In addition, Foley will relinquish \$1.27 million in claims against the Supply System. Litigation continues against Wismer and Becker Contracting Engineers, Inc.

Waste-to-energy facility construction is underway

● Westinghouse Electric Corporation's Resource Energy Systems Division has awarded Daniel International Corp., a unit of Fluor Corp., a \$7.8 million contract for construction of the Bay Resource Management Center in Panama City, FL. Work on the waste-to-energy facility is currently underway and is scheduled for completion in March 1987, according to Fluor Corp.

Defense activities get larger slice of DOE budget

WASHINGTON, D.C.—Proposals to privatize the federal power marketing administrations and transfer the uranium enrichment program to the private sector are among the highlights of the U.S. Department of Energy's \$12.1 billion fiscal year 1987 budget request.

Approximately \$128 million more than 1986's budget, the submittal also proposes placing a moratorium on further development and fill of the Strategic Petroleum Reserve, selling the Naval Petroleum Reserves and turning over responsibility for funding of conservation grant programs to the states.

The budget request shows increased funding for Defense Production and Support, and Waste Activities. (See table.) Budgets were cut in the areas of Research and Development, Business Enterprises, Grants and Other Energy Functions, and Departmental Management.

While the Defense Production and Support budget request increased by \$498 million, funds for R&D fell seven percent to \$4.5 billion.

Funding increases

Funding increases were requested for R&D programs in General Science, Environment, Supporting Research and Technical Analysis, Weapons Research, Development and Testing, and Naval Reactors Development. (See table.)

DOE's budget calls for decreases in funds for Magnetic Fusion, Nuclear Energy, Fossil Energy, Conservation, Solar and Other Renewables, and Electric Energy Systems and Storage.

Rep. Edward J. Markey (D.MA), chairman of the House Subcommittee on Energy Conservation and Power, said an analysis by his subcommittee of DOE's budget reveals a shift of \$1 billion from civilian energy programs to weapons programs.

"It is shameful to see important en-

ergy programs reduced or eliminated so that funds can be shifted to weapons production and Star Wars," he said in a statement. "The continued militarization of the Energy Department must be ended."

Markey's report noted that DOE has set aside about \$600 million of the total budget request for President Reagan's Strategic Defense Initiative.

Weapons activities grow

According to the analysis, DOE's weapons activities have grown from 38 percent of the department's budget in 1981 to 65 percent in the FY 1987 request. Between 1981 and this year, the report said funding for civilian energy programs dropped from \$5.4 billion to \$4.3 billion.

The analysis found that among non-nuclear energy programs, conservation would be hit the hardest with an overall 82 percent cut. Grant programs for low-income weatherization and schools and hospitals would be eliminated, and research would be cut by more than 58 percent.

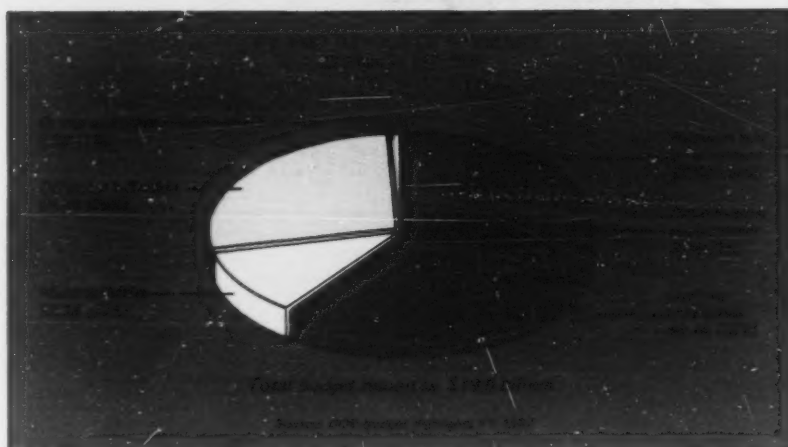
Markey's subcommittee said fossil energy research would be slashed 53 percent to \$150 million, and renewable energy research would be reduced 47 percent to \$92 million.

In the fossil energy area, magnetohydrodynamics would be eliminated, and coal liquefaction, combustion, and gasification research would be severely cut.

Programs in the solar and renewable area relating to photovoltaics, wind energy, and biofuels would be reduced by more than 50 percent.

The nuclear fission request is 17 percent higher than last year and the nuclear fusion request represents a nine percent drop.

DOE's nuclear energy R&D budget includes cuts for all areas except Space and Defense Power Systems (+\$51.5 million); Advanced Nuclear Systems (+\$4.1M); and, Program Di-



rection (+\$1.5M). Programs being reduced include Light Water Reactors (-\$7.1M); Advanced Reactor R&D (-\$75.1M); Facilities (-\$10.4M); and, Water Cooled Breeder Technology (-\$5.2M).

Among the most controversial aspects of the budget are President Reagan's plans to turn over several DOE business enterprises to private ownership in order to help lower the deficit.

Also, the budget states that fill activities for the Strategic Petroleum Reserve will be stopped this year when 500 million barrels of crude oil are in storage for emergency use.

PMA sale proposed

In a DOE publication outlining the 1987 budget, the agency said, "Legislation authorizing the sale of the Naval Petroleum Reserves and priva-

Continued on page 7

Electric growth should be strong in '86, says forecast

WASHINGTON, D.C.—A fall in real electricity prices and a growing economy should help keep electric output at a four percent growth rate in 1986, according to a new forecast from John O. Sillin.

Working as a utility analyst for the large accounting firm of Grant Thornton, Sillin recently updated his annual electric load forecast. In it he says, "Electric growth in 1986 will be similar to that experienced in 1984, when electric output increased by approximately 5.5 percent on a weather adjusted basis."

Assuming that the U.S. economy grows at least four percent this year, Sillin forecast that electric output should increase by at least a like amount.

"A boom type situation with economic growth above five percent would likely result in growth in electric output approaching six percent," he said in his update. "Clearly the determining factor regarding growth in electric output will be the performance of the economy."

The analyst predicts small to moderate economic growth in the first few months of 1986 and a strong third quarter. A control on inflation, declining interest rates and growth in the financial markets should spur further economic growth this year, said Sillin.

Output up

In 1985, Sillin noted that electric output (the total amount of electricity made available for consumption) was up about 2.5 percent over 1984, re-

sulting in a total increase of output of 11 percent since 1982 (see table p.9).

In his forecast, he reported that residential electricity consumption rose 2.5 percent in 1985 and commercial use increased 5.5 percent last year. Industrial consumption was flat in 1985, said Sillin.

"The strong growth in electric sales will make it increasingly easier for utilities to absorb capital additions into the rate base," he wrote. "With revenue increases being obtained from higher kilowatt-hour sales, the need to continue to seek rate relief will continue to abate."

If the nation experiences another year of strong electric growth, Sillin said it will be realized that new generating capacity is needed.

He said that midway through 1986, "it should be obvious that a fourth straight year of strong positive growth in electric output is occurring, at which time industry leaders, regulators, and policy makers will recognize the urgency in re-establishing the viability of investing in new central station generating plant."

A movement to commit

Sillin explained that he expects plants that are currently in a state of hiatus like Limerick-2 and Seabrook-2 will be completed first. "There will be a movement to firmly commit to those types of plants," he stated.

Sometime in late summer, Sillin believes that the regulatory community will become more and more convinced of lessening electricity supplies and

Continued on page 9

RESEARCH AND DEVELOPMENT		
	Budget Authority (in millions)	
	FY 1986 Estimate	FY 1987 Request
General Science	\$ 661.4	\$ 773.4
Magnetic Fusion	365.4	333.0
Nuclear Energy	377.4	332.7
Environment	228.6	273.8
Supporting Research and Technical Analysis	519.7	551.9
Fossil Energy	343.0	150.1
Clean Coal Technology	(99.4) ^a	(149.1) ^a
Conservation Research and Development	170.9	71.2
Solar and Other Renewables	173.6	91.9
Electric Energy Systems and Storage	28.8	16.2
Weapons Research, Development and Testing	1,729.8	2,101.2
Naval Reactors Development	535.7	593.6
Subtotal	\$5,134.3	\$5,289.0
Use of Prior Year Balances and Other Adjustments	-264.8	-750.0 ^b
TOTAL, RESEARCH AND DEVELOPMENT	\$4,869.5	\$4,539.0

^a Non add; transfers of previously appropriated funds.

^b Includes \$584.2 million of prior year unobligated balances in the Uranium Enrichment program.

DEPARTMENT OF ENERGY		
	Budget Authority (in millions)	
	FY 1986 Estimate	FY 1987 Request
Research and Development	\$ 4,869.5	\$ 4,539.0
Defense Production and Support	4,332.6	4,830.8
Waste Activities	1,363.6	1,774.3
Business Enterprises	869.4	691.4
Grants and Other Energy Functions	386.0	113.5
Departmental Management	150.3	151.1
TOTAL, DEPARTMENT OF ENERGY	\$11,971.8	\$12,100.1

Source: DOE Budget Highlights FY 1987

March story contained two errors

Two errors were made in the March 1985 *Electric Light & Power* front page story "Revenue, earnings increase for most electric utilities in '85".

Central South West Corporation had experienced a two percent decline in revenues last year, not a 5.2 percent increase as reported in the story.

Also, Boston Edison's earnings per share for 1985 and 1984 were incorrectly listed in the accompanying table as \$3.34 and \$3.12. Those figures are the company's dividend payments for 1985 and 1984. The utility's EPS should have been listed in the table as \$5.03 for 1985 and \$4.85 for 1984.

Electric Light & Power apologizes for the oversights.

Defense activities . . . from page 3

tization of the five Power Marketing Administrations (PMAs) will be proposed in 1986...It is assumed that the Naval Petroleum Reserves will sell at prices comparable to private oil field transactions, and that the PMAs will be sold for a fair return to the taxpayer."

The PMAs, which sell electricity from Federal hydropower projects, include the Alaska, Bonneville, Southeastern, Southwestern and Western Area administrations.

DOE said non-Federal owners could operate the PMAs as efficiently, if not more efficiently than the government. The agency expects to sell the Bonneville and Southwestern Administrations in FY 1988, with all others being sold by FY 1991.

Richard Pelz, former chief counsel for DOE's federal power marketing division, resigned his position in January protesting the planned sale.

"I cannot in good conscience work to implement this proposal because I believe it is economically disruptive, fiscally irresponsible, administratively harmful, and intellectually dishonest," stated Pelz in a statement announcing his resignation.

The budget proposes that BPA be sold by Oct. 1, 1987 for \$8.85 billion.

Pelz said the sale will probably make the government's situation worse in future years, because it will

lose the annual revenue produced by the five PMAs. He pointed out that each year the PMAs pay back more to the U.S. Treasury than they take in.

Unlike the other PMAs, BPA operates on a self-financed revolving fund basis. It requires borrowing authority from the government and not appropriations.

Opposed to the sale

Also opposed to the sale idea is the American Public Power Association (APPA). "The proposed sellout would put on the auction block the government's 130 hydroelectric plants which are vital sources of electricity—at rates based on cost, not profit—for many millions of households, busi-

nesses, industries and farms in 34 states," said APPA in a position paper on the subject.

"In fact," stated APPA, "the permanent loss of valuable, productive assets would cost the government billions of dollars in future revenues."

A report from the Cato Institute, a Washington, D.C.-based public policy research group, says the sale of BPA would benefit both taxpayers and Northwest energy consumers.

Author Peter D. Cooper says, "Selling the system's assets would...restore the free market to an economic sector that is drowning in the red ink and failed projects of government regulation."

"Freedom of contract should replace government coercion, leaving special interests to fend for themselves and leaving consumers and

utilities free to decide, without the distorting effects and hidden costs of government subsidies, what facilities and resources will meet their future energy needs," said Cooper.

The National Governor's Association adopted a policy statement Feb. 25 at their annual winter meeting opposing the sale of the PMAs. The governors warned that they believe "selling federal power projects will seriously jeopardize the economic vitality of individual states, entire regions of the country and the nation as a whole by forcing up electric costs for consumers. The governors support continued federal ownership of federal power projects."

A special task force, headed by DOE's William Silvey, was formed in late February to develop strategy for selling the PMAs.

Study says public power is cheaper in large cities

WASHINGTON, D.C.—Residential electric service costs about \$10 less in a big city with a public power company than in one served by a private company, says the American Public Power Association (APPA).

In a new study of utilities serving the 30 largest U.S. cities, APPA reports that costs for 500-kWh of electricity average 6.5 cents, or \$32.50 per month in the service areas of the nine public power systems surveyed.

While the 24 largest private electric companies charge an average of 8.5 cents, or \$42.50 per month for the same amount of electricity. Three cities in the survey have both public and private utilities.

APPA said its statistics were taken from reports submitted to the U.S. Energy Information Administration. The study looks at winter rate charges from Jan. 1985 for lighting, small appliances, refrigeration and cooking.

Electricity prices ranged from 2 cents per-kWh at Seattle City Light to Consolidated Edison's average of 14.9 cents.

According to the association, all nine publicly-owned utilities charge less than the private company average of 8.5 cents per-kWh. The nine utilities serve Seattle, Nashville, Memphis, Los Angeles, San Antonio, Columbus, Cleveland, Phoenix and Jacksonville.

The cities served by private utilities with the highest cost per-kWh include San Diego (13 cents), Philadelphia (10.8 cents), Boston (10.8 cents), El Paso (10.5 cents), Pittsburgh (9.9 cents), Phoenix (9.3 cents), and Chicago (8.7 cents).

APPA Executive Director Alex Radin noted he was "pleased that public power systems are taking the lead in providing reasonable rates for the category of customers which includes many low-income households."

The study was published in APPA's *Public Power* magazine.

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- Samchonpo 1 and 2 comprise Korea's first coal-fired power facility.

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Clean coal program . . . from page 1

the right direction.

"It's more suitable," he said, "whether its acceptable, I'm not sure."

According to Yamagata, coalition members have many questions that need to be answered. He said it is too early to tell what effect the new PON may have on potential proposers.

Yamagata believes that projects will be looked at on a case-by-case basis to determine whether repayment is necessary.

DOE's Porter explained that the program funds can't be called loans or grants. "We're providing financial assistance," he said. If a project fails in

the commercial operation stage, the owners would not be required to repay DOE, noted Porter.

"Many of these projects will be on the threshold of commercial opportunity," said Porter. "The companies involved stand to benefit quite a bit. DOE believes that if the taxpayers' money is being put at risk, they must be able to recoup their investment."

According to the department spokesman, DOE does not feel repayment will deter the number of proposals it receives.

U.S. Senate Minority Leader Robert C. Byrd (D.WV) told attendees of the Clean Coal conference that the fu-

ture of the program will now be determined by "you in the boardrooms of companies across the nation."

Said Byrd, "We in the Congress have worked to provide a framework which makes good business sense to the private sector, and which takes harsh fiscal realities into account. I know there is some concern that DOE seems to be overly enthusiastic in making those fiscal realities a bit more harsh than anyone intended."

The senator noted that he met with Herrington to ensure that the program gets off on the right foot.

NCA's Bagge said, "Clean coal can be buried and never heard of again if it is submerged in other research efforts, or if it is cut off from industry by onerous restrictions."

Money for coal technologies should not be spent searching for breakthrough technology, according to the association head. All of it should be earmarked for fostering the acceptance and growth of technology ready for the mainstream.

Bagge pointed out that the Gramm-Rudman-Hollings proposition may make it impossible to provide the \$5 billion for clean coal R&D called for by the recent special envoy's acid rain report. (See *EL&P* Feb. p.1) That, he said, makes the \$400 million clean coal program evermore important.

Coal use rises

According to Edison Electric Institute figures, the electric utility industry increased its coal use more than 60 percent from 1973 to 1983. It said there are approximately 1,300 coal-fired units in the U.S. generating

more than 55 percent of the nation's electricity.

The Environmental Policy Institute's (EPI) John McCormick believes the future of the program depends "...upon the support of environmental and down-wind state legislators who believed the program is an important component of the continuing acid rain debate in the nation."

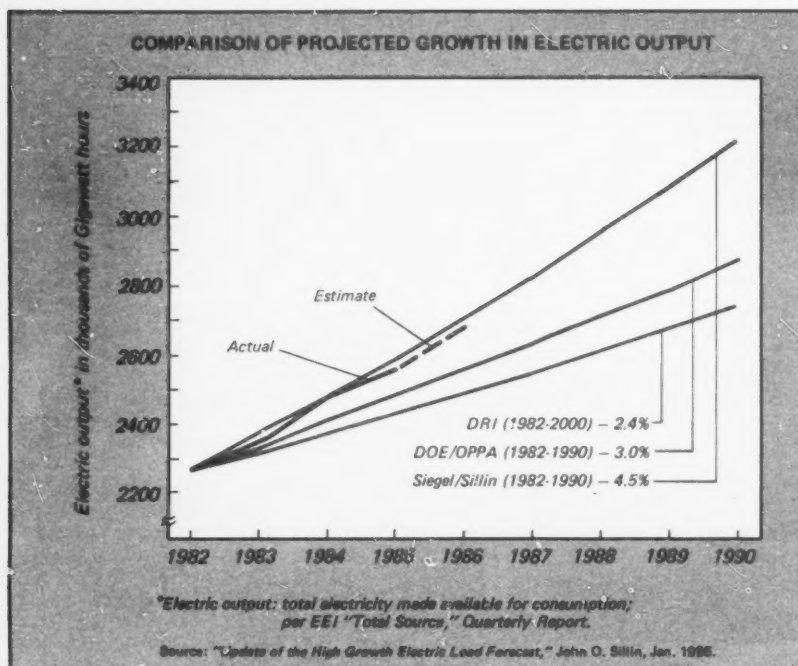
McCormick said the institute doesn't think \$400 million will be enough to provide incentives to the many worthy utility boiler retrofit proposals likely to be submitted. His group recommends that DOE give highest priority to proposals related to the commercial application of clean coal technologies for retrofit and new-source boilers.

If the program favors large synfuels-type projects and takes on the look of a mini synfuels corporation, McCormick warned the conference audience that EPI and others will do all they can to terminate the program.

Yamagata, of the Clean Coal Technology Coalition, said project selection criteria which Congress drafted as a guide for DOE indicates that projects which expand the use of a technology already in commercial use also will be eligible for the program.

He noted the program will be limited to technologies, techniques, or processes that will be ready for commercial application during the 1990s. DOE also is required to provide Congress with a report on all the projects submitted once the selections have been made. Congress then has thirty days to look over the selections.

Electric growth forecast . . . from page 3



send out strong signals to the utilities. Sillin said this should prompt the industry to prepare for new capacity additions.

Reserve margins

According to the forecast, reserve margins should continue shrinking this year, as growth outpaces new capacity additions. "And if the 1986 summer is a warm one," wrote Sillin, "scattered reliability problems—though not necessarily severe ones—may develop."

He told *EL&P* that one region to look at is the Northeast, where a growing population could eventually cause problems.

Sillin, who said he is bullish on the economy and the future of electricity growth, has been forecasting a strong recovery for the industry since the early 1980s along with John R. Siegel of the Atomic Industrial Forum.

"There are a number of things in the economy that indicate we're in a period of sustained economic growth," he said. Sillin pointed out that inflation is under control; interest rates are down; and, energy won't be the disruptive force that it was in the 1970s.

Tend to confirm

In a March interview, Sillin noted that recent developments in the economy tend to confirm his forecast of four percent electricity growth. With the stock market continuing to do well and the U.S. dollar weakening, Sillin predicts an eventual increase in domestic manufacturing.

"A stronger economy for domestic producers equates to increased load growth," he said.

And, as long as the energy markets stay deregulated, Sillin feels energy prices will be reasonably stable.

"The combined effect of increased sales, the continuing winddown of major construction programs, and stable or falling fuel costs will be another real decrease in electricity prices in 1986," he said in the update. "The decrease will likely fall in the two to three percent range."

Electricity prices down

According to the Grant Thornton analyst, real electricity prices have been down a total of three percent since 1982. He expects that trend to continue over the next few years. For 1986, Sillin forecasts a price drop, on an inflation adjusted basis, of between two and three percent.

Catching-up phase

"In my view," said Sillin, "the 1980s are a catching-up phase." In the 1990s, Sillin forecasts that economic growth and electricity growth will moderate at an annual rate of three percent.

Sillin said that recent conversations with utility industry executives indicate that he and Siegel are not the only ones forecasting strong electricity growth.

In for a roll

"I think that many folks feel that the industry may be in for a little roll," he declared.

New coal technology needed

WASHINGTON, D.C.—Only a fundamental improvement in coal plant technology can effectively respond to the increasing limitations on coal-fired electricity generation and restore economic progress in electricity production, believes an official of the Electric Power Research Institute.

"As a result," said EPRI Coal Combustion Systems Vice President Kurt E. Yeager, "the electric utility industry today stands on the threshold of change in its technological base for coal-fired generation."

He said successful new technology must satisfy two basic requirements. First, Yeager noted, they must have reduced cost and risk. Secondly, the new technologies must have a reduced environmental control impact.

Must be advanced

"To achieve these goals," stated Yeager, "the advanced coal technologies under development by the electric utility industry and EPRI must be rapidly advanced to commercial application."

Four major national objectives for a transition to clean coal technology need to be achieved. He said they are:

1. Establishment of a sounder scientific base to determine the need and appropriate timing of environmental controls.
2. Demonstration of an array of potentially more effective retrofitable emission control alternatives than the current FGD (scrubber) technology.
3. Demonstration of advanced coal utilization technologies over a sufficient range of conditions so as to establish performance, cost and reliability.
4. Establishment of incentives

to encourage the prompt commercial implementation of these technologies.

Technology update

Yeager discussed several coal technologies. He said Furnace Limestone Injection must still be considered a speculative and limited option, but that additional demonstrations are planned to evaluate the technology over the range of boiler design and coal types.

Fluidized Bed Combustion (FBC) technology is being aggressively pursued by the industry, said Yeager. He pointed out that more than 40 industrial boilers are now in operation, or under construction in the U.S.

Results of a recent survey of utility boilers indicate that as much as 25,000 MW of installed electric generating capacity may be suitable for conversion to FBC technology, he noted.

Two possible candidates for clean coal funds are pressurized fluidized bed combustion power plants being planned by Wisconsin Electric Power Co. and American Electric Power Co.

Another new important coal technology is gasification combined cycle (GCC). He pointed to the current demonstration of the 100 MW Cool Water station in California. "Over its first 18 months of operation," Yeager stated, "the plant has proved to be both reliable and environmentally superior."

EPRI said it has already spent \$500 million on clean coal R&D programs. In January, the institute announced a five-year, \$25 million effort that will team hardware suppliers from around the world in designing a new generation of more efficient coal-fired plants. (See *EL&P* March p.15)

Edison Electric Institute study says rate increases less in '85

WASHINGTON, D.C.—Rate increases granted to investor-owned electric utilities in the first three quarters of 1985 were \$593 million less than during the same period in 1984.

According to the Edison Electric Institute's (EEI) Quarterly Rate Action Survey, utilities were granted \$3,019 million in rate relief during the first three quarters of last year. In addition, \$2,850 million of increases were filed in 1985's third quarter, and the backlog of pending cases was \$7,870 million.

Reversing a trend of the previous four quarters, EEI said that increases in the third quarter of 1985 were up to \$1,473 million, a 29.4 percent increase over 1984's figure.

The \$431 million granted in 1985's

second quarter was the smallest quarterly increase in the past ten years, said the survey.

EEI pointed out that the \$2,850 million filed in the third quarter was a little less than the total filings for the first two quarters of the year.

Survey results show that the \$6,993 million of rate increases requested for the year ending Sept. 30, 1985 was approximately half the \$12.8 billion filed in the record year of 1983.

Third quarter requests

Rate increase requests pending at the end of the third quarter of last year rose 10.4 percent to 127 cases, compared to the same period in 1984 said EEI. However, the survey found that the dollar amount of those requests dropped 2.3 percent to \$7,870

million, from the \$8,055 million requested in 1984.

The Edison Electric Institute's Rate Regulation Dept. estimates that state commissions allowed an average return on common equity of 14.91 percent during the third quarter of 1985, as compared to 1984's 15.3 percent. In cases decided in the third quarter, EEI said regulatory lag averaged 9.4

months.

State commissions allowed an average of 50.5 percent of the amounts requested during the period, up from 45.2 percent in 1984.

EEI's survey is based on replies received from investor-owned electric utilities. Applications for fuel and tax adjustments were excluded from the survey.

ANNUAL ELECTRIC RATE ACTIONS

This tabulation represents companies which have reported on a quarterly basis to EEI.

	Year 1984		Jan.-Sept. 1985	
	Number of Actions	Total \$ Amt. (\$000)	Number of Actions	Total \$ Amt. (\$000)
Filed During Period (1)				
Increases	121r	7,824,201r	102r	5,772,986r
Decreases	2	8,269	4r	27,082r
Pending at End of Period (2)				
Increases	103r	7,887,189r	127	7,870,018
Decreases	2	8,268	0	0
Approved During Period				
Increases	186	4,745,036	88	3,019,149
Decreases	19	175,045	10	15,242
Withdrawn During Period				
Increases	3	155,990	2	83,288
Decreases	0	0	1	305
Denied During Period				
Increases	7	451,178	4	377,219
Decreases	0	0	0	0

Notes: (1) Does not include changes filed and either approved, withdrawn or denied during same quarter.
(2) These figures are not in addition to the corresponding filed figures.
r = revised.
Source: Edison Electric Institute

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MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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es don't have to open envelopes, rules Court

Arguing that it should not have to mail out opinions it didn't agree with, PG&E appealed the decision to the California Supreme Court. The state court decided not to review the case and it went to the Supreme Court.

PG&E property

The Court said the billing envelopes are the property of PG&E and that the utility should not be forced to spread opinions that it did not agree with.

"Compelled access like that ordered in this case both penalizes the expression of particular points of view and forces speakers to alter their speech to conform with an agenda they do not set," stated the Court.

PG&E spokesperson Roberta Bradley said the utility was very pleased. "We felt that the Court was upholding our First Amendment rights," she stated.

TURN Executive Director Sylvia Siegel told *EL&P* that the group "was disappointed that it (the decision) didn't go the other way."

She said TURN has asked the California PUC to issue a legal notice that would allow consumer groups and other organizations to be listed on a brochure that would be included in utility billing envelopes four times a year. Siegel explained that only the group names and addresses would be listed, with a box to be checked so the consumer could receive more information.

Continued on page 12

**Electric utilities
report on 1985
Story begins on p.15**

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ON, D.C.—A recent Court decision may mean utilities will no longer be forced to include consumer group messaging in billing envelopes. In a 5-4 decision, the Court ruled in *Pacific Gas & Electric v. Public Utilities Commission* that utilities are not required to include inserts in their utility bills that would allow consumer groups to deliver their views to ratepayers.

Justice Powell, who delivered the majority opinion, said the California Public Utilities Commission's order to PG&E to include the mailings in its bills was a violation of the utility's First Amendment rights.

Rights burdened

In the majority opinion, Powell wrote that the order "...impermissibly burdens appellant's First Amendment rights because it forces appellant to associate with views of other speakers on the basis of their viewpoints."

Joining Powell in the decision were Justices William Brennan, Sandra Day O'Connor and Chief Justice Warren Burger. Justice Thurgood Marshall concurred in a separate opinion. Justice Harry Blackmun took no part in the case.

In 1980, TURN asked the California PUC to bar PG&E from using its billing envelope space to distribute political editorials. The PUC determined that the "extra space" in the bill was the property of the ratepayer and allowed TURN to use the space four times a year for the next two years.

Electric utility oil usage to increase dramatically by 1994

WASHINGTON, D.C.—Oil use by U.S. electric utilities will likely rise by as much as 2.7 million barrels per day by 1994, according to a new study.

Done for the U.S. Committee for Energy Awareness by Science Concepts, Inc., *A Return to the Age of Oil?* suggests that an increase in electricity demand growth above what is currently forecast will lead to a substantial rise in oil imports.

"If demand for electricity grows faster than current projections," says the report, "U.S. oil imports will need to increase by as much as 3 million barrels per day by 1994."

The study found that the electric utility industry has reduced its oil consumption by an amount equal to one-third of the decline in U.S. oil imports since 1980.

Demand likely to rise

"Future electric demand is increasingly likely to exceed recent projections because of the continuing economic recovery of the nation and its probable acceleration because of the crash in world oil prices," states the report. "At the same time, there is little to suggest that major changes will soon occur in the financial and regulatory systems that have burdened many utilities and led to the current aversion to major new construction."

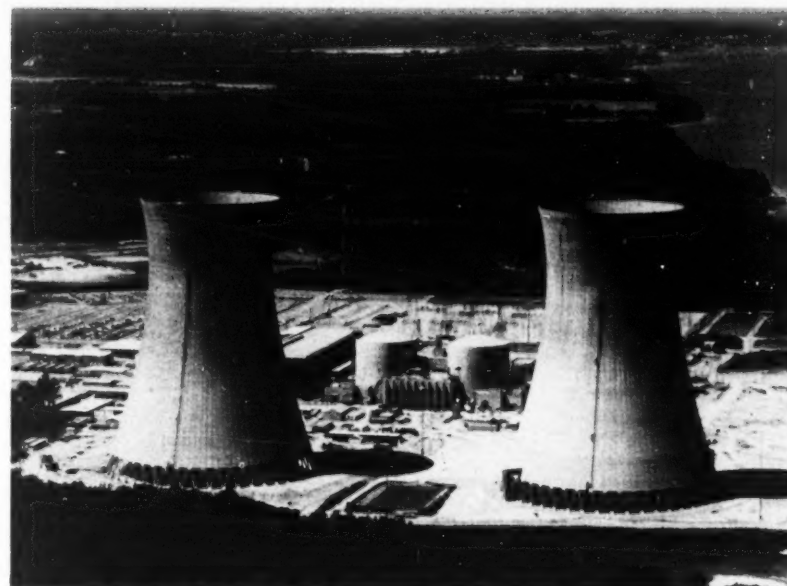
On April 2, oil prices fell to \$9.75 per barrel, their lowest level since 1977.

The report notes that since electric demand tracks economic growth, any increased growth in the economy will result in shortfalls of available and planned non-oil generating capacity.

"There is too little time between now and 1994 to put into place major amounts of new non-oil capacity," warned the study.

Because construction of nuclear and coal-fired plants have diminished the utilization of oil-fired units in the past ten years, the study's authors

Continued on page 14



Nation's 100th reactor licensed

Perry-1, the nation's 100th operable reactor, received a low-power license from the Nuclear Regulatory Commission on March 18. Owned by a consortium of five utilities and operated by Cleveland Electric Illuminating, the 1,205 MW boiling water unit located on the shore of Lake Erie was built by General Electric Company. The first utility-operated nuclear plant was the 60 MW Shippingport reactor activated in Dec. 1957. The U.S.'s 100 nuclear power plants total 86,418 MW of capacity, according to the Atomic Industrial Forum. The group said 28 other nuclear units are still under construction in the U.S.

Reagan endorses acid rain report of special envoys

WASHINGTON, D.C.—President Reagan announced in March that he fully supports the joint report on acid rain issued by the U.S. and Canadian special envoys.

In 1985, the President and Canadian Prime Minister Brian Mulroney commissioned Drew Lewis and William Davis to undertake a comprehensive study of acid rain. The two envoys submitted their report in January (see *EL&P* Feb. p.1).

The report called for the U.S. to initiate a five-year, \$5-billion program to commercially demonstrate new clean coal technologies. Lewis had told Reagan in a letter with the report that "there should be no doubt that acidic air emissions are being transported through the atmosphere and over the U.S./Canadian border. That transboundary air pollution is causing serious environmental concern in both countries because of the ecological, economic and cultural value of the resources at risk."

Beneficial process

At a March 19, 1986 meeting in Washington with Prime Minister Mulroney, Reagan said, "Serious scientific and economic problems remain to be solved. But in the spirit of cooperation and goodwill which has come to characterize the way Canadians and Americans approach their common problems, I am confident that we have begun a process which will benefit future generations in both our great countries."

Mulroney said acid rain threatens

the environment in both countries. He stated, "I am confident that we can move to early and substantial reductions of damage to our environment."

A White House spokesperson said the Administration will move forward with a program to develop and demonstrate innovative control technologies. The White House noted that \$700 million has been earmarked in this year's budget for clean coal research between 1986 and 1991. That money will be used by the Dept. of Energy and EPA for R&D programs already underway.

Also, the spokesperson added that an \$800 million joint industry/government program designed to develop and demonstrate new clean coal methods will be implemented.

The \$800 million represents \$400 million already earmarked by Congress for the government's clean coal program and the 50 percent matching contribution expected from industry sources.

Program funding

Funding for DOE's matching program is being made available this year at a level of \$99.4 million. In 1987 and 1988, \$149.1 million will be made available.

Although it doesn't have the funds now, the Administration said it will seek to provide the full funding recommended by the envoys sometime in the future. The spokesperson stated that states also will be encouraged

Continued on page 18

Gibbs & Hill awarded refuse-to-energy facility contract

● Gibbs & Hill, Inc., a subsidiary of Dravo Corp., has been awarded a contract from American REF-FUEL to design and engineer a refuse-to-energy facility in Newark, NJ. Power from the 60 MW plant will be sold to Public Service Electric & Gas Co. According to Dravo, construction is scheduled to begin this year and completion is expected in three years.

Diablo Canyon Unit 2 begins full commercial operation



Unit 2 of Pacific Gas and Electric Co.'s Diablo Canyon Nuclear Power Plant began commercial operation March 13 after a full-power testing program, according to PG&E Executive Vice President George A. Maneatis. Unit 1 started operating last May and, combined with Unit 2, can generate more than 2.2 million kW. The plant is located on the Pacific Ocean, midway between San Francisco and Los Angeles.

Detroit Edison sues PacifiCorp subsidiary

● PacifiCorp has reported that Detroit Edison Co. is suing Decker Coal Co. over treatment of certain taxes in computing the purchase price of the coal. NERCO Inc., a subsidiary of PacifiCorp, has a 50 percent non-operating interest in Decker. The firm said it plans to vigorously defend the lawsuit. Detroit Edison is seeking repayment, with interest, of the amount that it allegedly overpaid since 1975, as well as treble damages and costs of suit. Also sought is revision of the tax-related price adjustment provision of the existing coal purchase contract under which Detroit Edison buys 7.2 million tons of coal annually. The contract runs through 2001.

In This Issue

Editorial	4
Calendar	9
What are utility executives telling shareholders and employees? Selected highlights from the new annual reports of electric utilities across the nation.	15
New French fast reactor goes critical, but draws severe criticisms.G ..	19
Fuel cell R&D moves ahead, with economics of larger units improving.G	24
Full-scale, not partial testing of a service restoration program is the only way to determine if it really will work.T/D	28
New Products	32
Readers' Service	35
New Literature	37
Regulatory Review	39
Personnel	40
Management Methods	42

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

AEP requests funds for clean-coal demo program

● The American Electric Power System (AEP) has requested \$10 million from the state of Ohio toward a \$175 million clean-coal demonstration program using the pressurized, fluidized bed combustion process (PFBC). AEP System's management and technology arm, AEP Service Corp., is applying for the state funds on behalf of Ohio Power Co. Ohio Power is the owner of the Tidd Plant, now in mothballs, which is the site of the 70,000 kW demonstration facility. AEP also plans to ask the U.S. Department of Energy for \$60 million of the almost \$400 million appropriated by Congress to help fund clean-coal technology projects. AEP Service Corp.'s Vice Chairman-Engineering and Construction John E. Dolan said that to keep the PFBC project on schedule, final commitments must be made by October. If the requested funding becomes available from both federal and state governments, construction could begin next year with the plant in operation by 1990, according to AEP.

AWEA says Calif. windpower production tripled in '85

● According to the American Wind Energy Association (AWEA), California windfarms produced 23.8 million kWh of electricity for Southern California Edison Co. and Pacific Gas & Electric Co. in Dec. 1985. That figure brings last year's total windfarm output to 622.0 million kWh, three times more than the 188.1 million kWh produced in 1984, and 13 times more than the 47 million kWh generated in 1983. The cumulative total of power produced by windfarms in 1985, said AWEA, equaled 862.1 million kWh. AWEA Executive Director Tom Gray noted that the 1985 figures "confirm a remarkable record of achievement for an industry which literally did not exist five years ago." According to a General Electric study, there is enough wind energy available in the U.S. to provide more than a trillion kWh annually, about 40% of the nation's current demand.

PSC approves PSI rate increase

● The Indiana Public Service Commission (PSC) has approved a settlement agreement allowing Public Service Indiana (PSI) an 8.2 percent rate increase, or \$68.2 million annually, which will remain in effect until Dec. 31, 1989. PSI said, however, that it will not seek recovery of its canceled Marble Hill project through rates. According to the company, the PSC order restricts PSI's payment of common dividends for three years and general rate increases for four years. Capital spending will be limited for the next three years to \$285.1 million. PSI was authorized by the commission to include in its retail rates a five percent emergency surcharge that was granted in March 1984. Also, the Securities and Exchange Commission approved PSI's plan to report \$475 million as an asset. The asset is equal to future tax benefits which, state regulators said, can be realized as a result of the Marble Hill loss. Based on the PSC rate order, Moody's Investors Service confirmed a Ba3 rating on PSI's first mortgage bonds and secured pollution control revenue bonds and a B1 rating on the company's unsecured pollution control revenue bonds. Moody's placed PSI's debt ratings under special review in Nov. 1985.

PG&E files for rate reduction

● According to Pacific Gas & Electric Co. (PG&E) Chairman and Chief Executive Officer Frederick W. Mielke, Jr., the company filed a request in early April for a \$662 million electric rate decrease and in March filed for a \$256 million decrease in its natural gas rates. Of that amount, \$210 million is due to lower costs of natural gas used to generate electricity, \$280 million is because of the abundant rain and snow that result in more low-cost hydroelectric power and \$150 million is from lower payments to geothermal steam producers and alternative energy producers. An extra \$22 million is because of other factors, said PG&E. The company noted that additional rate reductions of up to \$340 million are possible, depending on the price of hydro power imported from the Pacific Northwest; on various economic conditions; and, on the chance that hydro conditions will prove better than expected. In March, PG&E notified the California Public Utilities Commission that it is reducing its general rate increase request by \$282 million to \$690 million. The increase, to take effect January 1987, is likely to be reduced further if favorable economic conditions continue, said Mielke.

NCA study says coal plant emissions declined

● The National Coal Association (NCA) reported in a recent study that sulfur dioxide emissions, per ton of coal consumed at coal-fired power plants, declined by 4.6 percent a year between 1980 and 1984, despite a 100 million ton a year increase in coal use. The NCA added that data from the first 11 months of 1985 indicates that the trend is continuing. NCA Executive Vice President A. Denny Ellerman said of the decline, "Based on our understanding of the factors influencing SO₂ emissions and the latest forecast for coal use between now and 1990, we are confident that the downward trend will continue at least through 1990, the end point in this study."

Clinton nuclear plant fuel loading delayed

● Illinois Power Co. delayed the fuel loading at its Clinton nuclear plant which had been planned for March. The Nuclear Regulatory Commission requires that more testing be done on the plant and Illinois Power management has determined that the completion of testing and preparing the plant for operation is more difficult and requires more time than was scheduled. Illinois Power Chairman and President Wendell J. Kelley said, "...We are going to take all the time necessary to build an absolutely safe plant." Illinois Power Co. said it is in the final process of testing the plant, however the NRC will determine when fuel loading can begin at Clinton.

Stonybrook unit ranked most efficient plant in 1984

WASHINGTON, D.C.—Massachusetts Municipal Wholesale Electric Company's Stonybrook combined cycle plant was the most efficient generating station in the U.S. in 1984, according to a recent report from Utility Data Institute.

The plant had a heat rate of 8838 Btu per kWh. The Tennessee Valley Authority's Bull Run station, which logged 1983's top heat rate, dropped to third place with a heat rate of 8960 Btu per kWh. Georgia Power Company's McDonough coal plant came in second with a 8903 Btu per kWh heat rate.

UDI's report contains top 100 rankings on heat rate, production expense and net output. The top 20 plants, ranked by heat rate and production expense, are shown in the tables.

Top nine are coal-fired

Nine of the top 10 most efficient plants are coal-fired. Canal Electric Company's Canal plant had the lowest heat rate among oil-fired plants (9394 Btu per kWh). Houston Lighting & Power Company's Bayou plant had the lowest heat rate (9870 Btu per kWh) for gas-fired plants.

UDI's data base of 641 plants represents about 95 percent of the total electricity generated by steam-electric plants in the nation in 1984. The plants represent a total capacity of 492 GW. Data used in the report was compiled from FERC Form 1s, EIA Form 412s and REA Form 12Ds.

Of the 100 most efficient plants, UDI noted that 84 were coal-fired, 8 oil-fired, 5 gas-fired and 3 combined cycle plants. No nuclear plants were included because of the variability among utilities in reporting fuel consumption and heat content of nuclear fuel.

As they did in the previous two reports, West Texas Utilities Company and Gulf States Utilities Company were at the top of the production expenses rankings.

West Texas garners top spot

West Texas Utilities took over the number one ranking in 1984 from Gulf States, whose Sabine station lost its

top ranking from 1983. One change from 1983's report is the loss of nuclear units from the top 20. UDI's report shows that 13 nuclear units were in the top 20 in 1983, while only 8 made it in 1984.

Of the top 100 stations that produced the least expensive power, UDI reported that 68 were coal-fired, 27 were nuclear and 5 were gas-fired. No oil-fired plants made the list.

Of the 641 total plants, the 51 nuclear plants had the lowest average production expense at \$18.17 per MWhr. Next came the 378 coal plants at \$22.32 per MWhr, the 149 gas-fired units at \$42.98 per MWhr, and the 55 oil-fired units at \$55.30 per MWhr. The eight units using "other" fuels cost an average of \$4.76 per MWhr.

The nuclear units came in with the lowest average fuel expense at \$7.18 per MWhr, while the oil-fired stations had the highest at \$49.84 per MWhr.

Average production expenses

UDI said average production expenses for the entire group were \$25.87 per net MWhr and average fuel expenses were \$20.64 per net MWhr.

The institute also published a comparison of 1983 and 1984 expenses for a selected group of large steam electric plants.

According to the report, the total cost of operating and maintaining the 641 plants in 1984 totalled approximately \$51.7 billion. About \$41.2 billion of that was attributable to fuel purchases, said UDI.

Third report added

Institute President Liz Hannon said a third report was added this year that covers unit-specific O&M costs for 146 units where data were unavailable to UDI.

All three reports are available from UDI for \$300. For more information, call the group at (202) 466-3660.

UDI is a private not-for-profit services company. The firm is responsible for managing and updating the Edison Electric Institute's Power Statistics Data Base, and works for EPRI and other utility groups.

TOP 20 U.S. STEAM ELECTRIC PLANTS IN 1984
RANKED BY BTU PER KILOWATT HOUR

No.	Plant or unit	Heat rate (Btu/kWhr)	Operator	Primary fuel type	1984 Installed capacity	1984 Net generation (MWhrs)
1	Stonybrook	8838	Mass. Muni. Whsl. Elec. Co.	CCYC	389	855,640
2	McDonough	8903	Georgia Power Co.	Coal	598	3,620,982
3	Bull Run	8960	Tennessee Valley Auth.	Coal	950	5,094,416
4	Marshall (NC)	9078	Duke Power Co.	Coal	1,996	9,932,330
5	Belews Creek	9135	Duke Power Co.	Coal	2,160	10,880,004
6	JH Campbell	9250	Consumers Power Co.	Coal	1,420	8,339,091
7	Mountaineer	9317	Appalachian Power Co.	Coal	1,300	7,883,948
8	Crystal River 4&5	9327	Florida Power Corp.	Coal	1,479	5,229,355
9	Gallatin	9360	Tennessee Valley Auth.	Coal	1,255	8,839,033
10	Bay Shore	9376	Toledo Edison Co.	Coal	839	3,551,159
11	Canal	9394	Canal Electric Co.	Oil	1,072	6,210,223
12	Genoa 3	9445	Dairyland Power Coop.	Coal	346	1,922,826
13	Amos	9452	Appalachian Power Co.	Coal	2,933	14,758,193
14	Morgantown	9456	Potomac Electric Power Co.	Coal	1,252	6,775,713
15	McMeekin	9464	South Carolina Elec. & Gas.	Coal	294	1,768,534
16	John Sevier	9480	Tennessee Valley Auth.	Coal	800	5,000,285
17	Milliken	9482	New York State Elec. & Gas.	Coal	322	2,210,013
18	Clinch River	9499	Appalachian Power Co.	Coal	713	3,672,062
19	New Haven Harbor	9506	United Illuminating Co.	Oil	485	2,683,536
20	New Boston	9522	Boston Edison Co.	Oil	718	3,512,880

Source: 1984 Production Costs, Operating Steam Electric Plants, March 1986.

TOP 20 U.S. STEAM ELECTRIC PLANTS IN 1984 RANKED
BY AVERAGE EXPENSES (INCLUDING FUEL) PER NET MEGAWATT HOUR

No.	Plant or unit	Average expenses/net MWhr	Operator	Primary fuel type	1984 Installed capacity	1984 Net generation (MWhrs)
1	Rio Pecos	4.01	West Texas Utilities Co.	Gas	142	1,078,636
2	Sabine	5.08	Gulf States Utilities Co.	Gas	2,051	11,417,511
3	Neches	6.46	Gulf States Utilities Co.	Gas	341	1,317,226
4	Prairie Island	9.94	Northern States Power Co.	UR	1,186	8,085,345
5	Colstrip	10.11	Montana Power Co.	Coal	1,495	6,952,232
6	Zion	10.33	Commonwealth Edison Co.	UR	2,196	11,888,167
7	Hayden	10.36	Colorado-Ute Elec. Assn.	Coal	465	2,786,691
8	Big Brown	10.84	Texas Utilities Elec. Co.	Coal	1,187	7,540,702
9	St. Lucie	10.93	Florida Power & Light Co.	UR	1,700	9,621,496
10	Big Cajun One	11.11	Cajun Electric Power Coop.	Gas	230	273,778
11	Oconee	11.28	Duke Power Co.	UR	2,867	18,818,954
12	Calvert Cliffs	11.60	Baltimore Gas & Elec. Co.	UR	1,828	11,651,194
13	Laramie River	11.66	Basin Electric Power Coop.	Coal	1,710	8,193,689
14	McGuire	12.28	Duke Power Co.	UR	2,440	12,976,800
15	Turkey Point 3&4	12.41	Florida Power & Light Co.	UR	1,520	7,864,658
16	MR Young	12.64	Minnesota Power Coop.	Coal	673	3,514,002
17	Four Corners	12.72	Arizona Public Service Co.	Coal	2,271	13,789,489
18	Monticello (TX)	12.88	Texas Utilities Elec. Co.	Coal	1,980	12,608,286
19	North Anna	12.89	Virginia Elec. & Power Co.	UR	1,959	8,501,984
20	JE Coretta	12.95	Montana Power Co.	Coal	172	574,436

Source: 1984 Production Costs, Operating Steam Electric Plants, March 1986.

France's Superphenix breeder is on-line; controversy brews

SPECIAL TO EL&P
Jacques Neher, Correspondent

PARIS—France has flicked the switch on the world's first commercial-sized fast breeder reactor, but it's already shaping up as something of a white elephant.

Christened Superphenix at powering up ceremonies in Creys-Malville in southeastern France in January, the 1200-MW reactor appears likely to breed plenty of controversy in the next few years as the French govern-

ment confronts the question of whether to continue the program.

Ultra-expensive technology

The primary problem is money. Built at a cost of about \$3.4-billion, Superphenix's capital investment was 2.5-times higher per kW than that required for conventional nuclear power plants. What's more, production costs per kWh at Superphenix are twice that of conventional nuclear plants.

Electricite de France, the national

utility that ordered the facility, acknowledges the cost problems but is asking for time in which to learn how to make the razzle-dazzle technology commercially feasible.

Paradoxically, one way to lower costs, claims EdF, would be to build more breeder reactors. "If we [build] the breeder reactor in a series of five to ten units, the cost of a kWh produced would drop to only 1.5-times more than conventional nuclear power," said EdF spokesman Claude Gaborau.

Decision expected in 1987

The government is expected to decide next year whether to make additional investments toward commercializing breeder technology. But industry observers here are not optimistic.

"It's a bit of a luxury," said a Paris-based energy consultant who asked not to be identified. "Even considering how chauvinistic the French are," he added, "there are limits. I don't

think we can afford it."

But Gilbert Darmon, secretary-general of Framatome, parent of the company that built Superphenix, said it's necessary to take the longer view.

Insurance for 21st century

"The breeder reactor, he said, "is insurance for the 21st century in the case that uranium becomes too costly or unavailable...It's a guarantee of our independence. Considering that, the cost is inconsequential; insurance is [only] expensive until the accident."

Current benefits

Superphenix already may be paying off in another way, even while it burns money. "It gives France's nuclear program an image of being technically competent," said Darmon. In doing so, he added, it could help Framatome in its efforts to sell its technology to other countries.

"The world is certainly more attentive to us now," he said.

B&W receives Alabama Power contracts

NEW ORLEANS, LA—Babcock & Wilcox, an operating unit of McDermott International, Inc., has received two contracts from Alabama Power Co.

One, a \$5 million contract, is for three pulverizers, replacing three existing pulverizers at the company's Green County Steam Plant. B&W is

also modifying the boiler burners to enhance fuel conservation, while providing burner piping duct work.

The other is a \$2 million contract to replace and upgrade the secondary superheater and reheat superheater of an existing 250-MW radiant boiler, to be installed at Alabama Power's Gaston Steam Plant.

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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Net income, EPS fall for Top 100 electric utilities

Robert A. Lincicome
EL&P Editor-in-Chief

BARRINGTON, IL—Net incomes and earnings for common stock of the Top 100 electric utilities fell in 1985, for the first time in the 21-year history of *Electric Light & Power's* annual report.

The Top 100 utilities suffered massive write-offs of non-reimbursable investment in cancelled nuclear plants that slashed total net income almost 15 percent, to \$14.23-billion from \$16.71-billion for 1984. Top 100 utilities also were adversely affected by generally higher costs of operations, despite strong cost curtailment efforts and the low inflation rate.

The only good thing about the income decline is that the affected utilities have the write-offs behind them and have already begun rebuilding.

Average earnings per-share fell 30-

cents per share, or 9.6 percent, to \$2.84 from 3.15 in 1984. However, the write-offs of Public Service of Indiana and Consumers Power were so large in 1985, that if their financial results were removed from the tabulation, per-share earnings would have increased to \$3.19.

The 21st Annual Top 100 Electric Utilities report begins on page 17

Kilowatthour sales were up slightly for the Top 100 electric utilities, increasing 1.6 percent to 2-trillion kWh. The increase resulted largely from a healthy gain in commercial sales activity and higher sales to other utilities for resale.

Revenues were up to \$149.9-billion in 1985, an increase of 3.9 percent. Operating utilities, without holding company affiliations performed better than holding companies.

Informing the public becomes priority for nuclear industry

Don Minner
Associate Editor

BARRINGTON, IL—Nuclear power organizations in America have taken the offensive in recent weeks to inform the public about differences in the U.S. and Russian nuclear power industries.

In the wake of the Chernobyl accident in late April, the top priority for many nuclear organizations and utilities has been to field questions from the media and public, and to stress the unlikelihood of a similar accident occurring in the U.S.

Nuclear power advocates are concerned that the Russian incident may hinder the progress of nuclear licensing reform legislation and a bill to extend the Price-Anderson nuclear liability act. In addition, industry officials believe that anti-nuclear groups may be able to use the accident to delay plants waiting to be licensed.

Carl Goldstein, vice president of the U.S. Committee for Energy

Awareness, said his organization feels an obligation to ease concerns. The industry-sponsored group re-directed its print advertising campaign and at press time was planning to run a series of explanatory advertisements in major U.S. daily newspapers beginning in May.

Focus of ads

According to Goldstein, the series focuses on the safety of U.S. reactors and directly compares the reactor design differences between the two nations. He said the ads also stress the great amount of independent oversight that the nuclear industry in the U.S. receives from groups like the Nuclear Regulatory Commission, Congress and others.

In addition, he noted that Duke Power Company Chairman and CEO Bill Lee addressed a variety of groups in May on the accident that included, congressmen, New York financial analysts and members of the Washing-

Continued on page 9



Electric capacity added for July Statue of Liberty rededication

Preparations are underway to make sure that electricity will be available to light the Statue of Liberty when President Reagan switches on the power during rededication ceremonies July 3. Crews recently laid a new 4,160-volt cable, wrapped in red, white and blue sheathing, from Liberty State Park in Jersey City that will virtually double the capacity to Liberty Island. The project is a joint effort of Public Service Electric & Gas Company, the Okonite Company, and the Simplex Wire and Cable Company. A new air conditioning system for the Statue, several new elevators and new exterior lighting were installed.

EIA's new outlook predicts electricity growth of 2.7% per year

WASHINGTON, D.C.—Electricity demand in the U.S. will grow at a 2.7 percent a year rate through 1995, according to the Energy Information Administration.

In its *Annual Outlook for U.S. Electric Power 1986*, EIA said electricity demand growth is expected to vary considerably by region, from a low of 2.1 percent a year in the New York/New Jersey region to a high of more than 3.3 percent a year in the North Central, Northwest and Western regions.

"Whereas in the past industrial

electricity demand was expected to grow more rapidly than Gross National Product, in this forecast it is projected to grow less rapidly, at an annual average rate of 2.6 percent," stated the report.

EIA attributed the slowdown to expected continued gains in industrial energy conservation and to lower overall growth rates in energy-intensive industries.

The report projects that electricity demand will be slightly lower than economic growth, except under slower economic growth conditions. It

covers the period from 1985-1995.

Electricity consumption is expected to grow no faster than GNP, but EIA said it should grow more rapidly between 1985-1995 than nonelectricity energy consumption.

EIA's report shows that more than 85 percent of the increase in total energy use by 1995 is attributable to greater energy use by electric utilities.

The report says, "...electricity as a delivered service is increasingly preferred over other energy sources for its convenience, versatility and

price."

Over the period covered in the study, residential electricity consumption should remain at 34 percent, commercial at approximately 29 percent and industrial at about 37 percent.

"Real electricity prices are projected to increase slightly through 1987 and then decline by 1995 to about 8 percent below 1985 levels," predicts EIA, "primarily as a result of declining capital costs per unit of electricity."

Continued on page 8

GPU Nuclear lawsuit dismissed

● A lawsuit seeking to revoke GPU Nuclear's license to operate the Three Mile Island nuclear plant has been dismissed by the U.S. Third Circuit Court of Appeals. The decision upholds an earlier finding by the U.S. Nuclear Regulatory Commission that GPU Nuclear has the competence and integrity to operate the plant safely. The lawsuit was brought to court by several Pennsylvania legislators and three anti-nuclear groups from New Jersey and Pennsylvania.

HEI acquires two marine transportation subsidiaries

● Hawaiian Electric Industries Inc. (HEI) has acquired two Hawaii-based marine transportation subsidiaries from Dillingham Corp. According to HEI, the two companies, Young Brothers and Dillingham Tug and Barge, had combined revenues totalling approximately \$43 million in 1985. Young Brothers moves over 2.5 million revenue tons of cargo per year between six Hawaiian ports and Dillingham Tug and Barge provides contract towing, fuel transportation and ship bunkering, ship assist work and charter barge operations.

Millstone 3 begins commercial operation

● Northeast Utilities (NU) said its Millstone 3 nuclear power plant has begun commercial operation ahead of schedule. The 1,150-MW pressurized water reactor received its full-power license from the Nuclear Regulatory Commission in January and began producing nuclear-generated electricity on February 12. The unit was scheduled to begin commercial operation May 1, but started several days earlier, according to NU.

PSE&G stockholders approve holding company

● The stockholders of Public Service Electric and Gas Co. (PSE&G) have approved the formation of a holding company, Public Service Enterprise Group Inc. (Enterprise). PSE&G Chairman, President and CEO Harold W. Sonn stressed that "PSE&G will continue as a regulated utility—the principal subsidiary of Enterprise—and will have first priority." Enterprise will have two non-regulated subsidiaries as well, Community Energy Alternatives and Public Service Resources Corp., an investment subsidiary.

Chinshan 2 breaks continuous power run record

● Taiwan Power Co. said its Chinshan 2 boiling water reactor nuclear power plant completed a 417-day continuous power run, breaking the second longest run record set by Connecticut Yankee Atomic Power Co.'s Connecticut Yankee plant. The longest run is 439 days by the Oconee 2 unit of Duke Power Co. The 604-MW Chinshan 2 unit, in operation since 1979, is supplied by General Electric Co.'s Nuclear Energy Operations.

NEPOOL reports production cost savings increase

● The New England Power Pool (NEPOOL) said it provided New England electric utilities with energy production cost savings of approximately \$37 million in 1985, a 33 percent increase from 1984. The increased savings were due to nuclear generation, coal-fired power and substantial purchases of economy energy from neighboring power pools, according to NEPOOL's 1985 Annual Report. NEPOOL Executive Director Phillip C. Otness said, "Although oil prices started to decline in 1985, much of the credit for lowering the cost of energy should go to NEPOOL member companies for taking actions such as coal and multiple fuel conversions of existing generators to improve the energy mix and increase the economic flexibility of bulk power supplies."

EPRI approves revised 1986 budget

● The Electric Power Research Institute (EPRI) has approved a revised 1986 budget, enlarged board membership from 15 to 24 directors and appointed new members to its Advisory Council. The budget, revised due to a three percent decrease from 1985 revenues, totals \$311 million. EPRI President Floyd L. Culler said, "The revised budget reflects a temporary decline in membership revenues, the result of several large utilities facing financial problems associated with new nuclear plant construction programs." EPRI said its financial plan assumes member revenues will be generally level through 1988 and has informed its members that there will be no substantive changes in dues levels. Administrative and support expenditures will be reduced through the cancellation of executive salary increases for 1986 and by a reduced general merit increase which will be delayed for one quarter, according to EPRI.

Secretary of Energy releases annual report to Congress

● The Secretary of Energy's seventh Annual Report to Congress is now available. The 200-page report covers energy policy; conservation and energy supply research and technology development; civilian radioactive waste management; energy supporting research and high energy and nuclear physics. It also includes information on environment, safety and health; energy production and marketing; emergency preparedness; international programs; nuclear nonproliferation; the information and regulatory responsibilities of the department; national security and defense programs and departmental management and administration. The report can be obtained for \$11.00 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The GPO stock number is 061-000-00674-5.

WP&L supports state acid rain control bill

● Wisconsin's new acid rain control bill has the support of Wisconsin Power & Light Company (WP&L). Utility Executive Vice President Bill Keepers said, "We feel that the acid rain control bill signed into law Tuesday, April 22, by Governor Anthony Earl, represents a balanced approach on limiting sulfur dioxide (SO₂) emissions." The bill's timetable calls for a 50 percent reduction in SO₂ emissions by 1993, compared to 1980 levels. Keepers pointed out that utilities have been trying to reduce emissions for years. "Since 1970, while electric generation in Wisconsin has increased by 62 percent, utility SO₂ emissions have declined about 13 percent...." He added that there will be costs associated with further reductions in emissions, which will mean increased electric rates in the 90's for all WP&L customers.

Braidwood 1 successfully supplies power to Edison's grid

● Commonwealth Edison said that its Braidwood 1 generating station is supplying power to the company's northern Illinois electrical grid after successful pre-operational testing. Fuel loading at the station, which is 94 percent complete, is expected to begin this fall and full-scale power production is scheduled for May 1987, according to the company.

Iowa Resources announces two-for-one stock split

● Iowa Resources Inc. said it authorized a two-for-one common stock split and a dividend increase of 40 cents per share after the split. The split goes into effect June 2 and the increased dividend will be payable August 1. According to Iowa Resources, stockholders approved a measure that increased the number of company authorized stock shares from 20 million to 60 million. The company noted that after the split the new annualized rate will be \$1.60, up from \$1.58 and that nearly 22.3 common shares will be outstanding after the split. Iowa Resources said that in recent weeks the stock's price reached record levels, peaking at \$41 per share.

NRC gives Palo Verde 2 license for full power operation

● Unit 2 of Arizona Public Service Company's Palo Verde nuclear generating station has been licensed for full power operation by the Nuclear Regulatory Commission Office of Nuclear Reactor Regulation. The NRC said the unit's output will be about 1270 MW. Other owners of the station are Salt River Project Agricultural Improvement and Power District, Southern California Edison Co., El Paso Electric Co., Public Service Co. of New Mexico, Los Angeles Department of Water and Power and Southern California Public Power Authority.

Three utilities earn EEI Affirmative Action Awards

● The Edison Electric Institute (EEI) has awarded three investor-owned utilities its 1986 Outstanding Achievement in Affirmative Action Award. Receiving the awards were Duke Power Co., for its "Employee Incentive Goal Program: Affirmative Action"; Florida Power Corp., for its "Customer Operations Assistant Program"; and South Carolina Electric & Gas Co., for its "Handicap Employment Program." EEI also presented Certificates for Meritorious Achievement to Detroit Edison Co., for its "Minority and Female Career Pathing for Upper Management" and "Scholarship Program/Special Recruiting Source"; Northeast Utilities, for its "Bilingual Equipment Operator Assistant Training Program"; Public Service Electric & Gas Co., for its "Computer Training Program for the Severely Disabled"; Baltimore Gas & Electric, for its "Minority Scholarship Program"; Public Service Co. of Colorado, for its "Female Training and Placement for Public Assistance Recipients"; Central Illinois Light Co., for its "Career in Utility Management" program; and New York State Electric & Gas Corp., for its "Women's Employment Opportunity Committee" program.

In This Issue

Editorial	4
Calendar	11
21st Annual Top 100 Electric Utilities Report reveals industry growth and recovery slowed in 1985.	17
Optimized distribution secondary design provides savings by adding more smaller transformers and reducing secondary cable use. T/D	27
Customer-owned generation can impose dangerous and destructive over-voltages on islanded feeders connecting them to the system. G	42
New Products	48
Bulletin Board	52
Readers' Service	53
Regulatory Review	59
Personnel	60
Management Methods	62

ELAP readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (*) in the upper right corner of page 1; the T/D edition carries two dots (**). All readers receive ELAP's industry news section.

World not prepared for decommissioning plants

WASHINGTON, D.C.—Not one of the 26 countries using nuclear power is prepared for the task of decommissioning the plants, says the author of a new report from the Worldwatch Institute.

Cynthia Pollock points out that although nuclear power supplied 13 percent of the world's electricity in 1984, not one large commercial unit has ever been dismantled. She says that the subject of decommissioning is getting less attention than it deserves.

According to the report entitled *Decommissioning: Nuclear Power's Missing Link*, dozens of small research and military reactors in the U.S. are no longer used and four small retired commercial reactors are awaiting decommissioning. Estimates from the Nuclear Regulatory Commission show that 67 large commercial units will cease operating before 2010.

As for the rest of the world, the report says that more than a dozen reactors are already shut down, 66 will probably be retired by 2000, 162 more will reach their thirtieth year of operation in the next decade. (See table).

"Countries with advanced nuclear programs will soon start to feel the pressure associated with managing the 'back end' of nuclear power production," said Pollock.

Another large expense

She believes that utility companies and ratepayers don't want to face another large expense associated with nuclear power. As for politicians, Pollock said they don't want to tackle an issue that won't be addressed until after their political life.

"Developing new technologies and formulating complicated regulatory guidelines for safety handling, transporting, and disposing of radioactive wastes will be difficult to accomplish in such a milieu," Pollock said in the report. "But there can be little argument that public health

Entered service	Reactors, number	Capacity, megawatts	Planned retirement after 30 years of operation
1956-60	13	780	1986-1990
1961-65	22	3,920	1991-1995
1966-70	31	10,831	1996-2000
1971-75	84	54,351	2001-2005
1976-80	78	61,476	2006-2010
1981-85	133	117,546	2011-2015
Cumulative in operation	361	248,904	1986-2015
1986-90*	122	114,061	2016-2020
1991-95*	22	18,099	2021-2025
Total	505	381,064	

*Under construction or on order.
Source: "Decommissioning: Nuclear Power's Missing Link," C. Pollock, April 1986.

and safety and the financial solvency of utilities demand accelerated research on and financial planning for decommissioning."

The largest plant ever fully dismantled and decommissioned was the 22 MW Elk River plant. Pollock said DOE completed the three-year project in 1974 at a cost of \$6.15 million.

DOE is currently decommissioning the 72 MW Shippingport plant in western Pennsylvania, the nation's first commercial reactor. She criticized DOE for deciding to keep the reactor pressure vessel in one piece instead of chopping it up. The vessel will be buried in an earthen trench at the Hanford nuclear reservation in Washington. By sending the vessel whole, she estimates that DOE will be able to save about \$7 million.

Shortsighted action

"This action is shortsighted," stated Pollock. "By employing cost-cutting measures now, DOE is depriving the international nuclear industry—the same one it helped foster—of invaluable lessons. Larger reactors may be too big to ship in one piece, and the most difficult task decommissioning crews of the future will face is dismantling the pressure vessel and its contents."

ing crews of the future will face is dismantling the pressure vessel and its contents."

In Europe, the first decommissioning experience will come from the 100 MW Niederaichbach unit in West Germany, the 33 MW Windscale advanced gas reactor in the United Kingdom, and the 45 MW French G-2 gas reactor at Marcoule.

Reporting on a recent survey of 30 U.S. electric utilities, Pollock said that 22 plan to promptly dismantle and remove their reactors following shutdown. Japanese utilities are told not to wait longer than 10 years after closure to dismantle nuclear units. While in Canada and France, Pollock said utilities plan to mothball the plants for several decades before dismantling them.

Mothballing reactors

Pollock suggests in the report that mothballing reactors may become the only feasible decommissioning strategy, if there is no place to ship the spent fuel.

She explained that almost all of the 12,000 metric tons of spent fuel in the U.S. is currently being stored tempo-

rarily in water-filled utility holding ponds. "The volume of waste is expected to quadruple within 15 years," says the report. "Utilities do not have adequate space for storing this spent fuel, nor is there anyplace they can send it."

As for decommissioning costs, Pollock said no one really knows how much money it will take. Estimates range from \$50 million to \$3 billion per reactor. She noted that most of the reactors will be ready for decommissioning between 2000 and 2020.

It is expected to cost \$98 million (\$1.36 million per MW) to decommission the Shippingport facility. Pollock said in the report that the figure doesn't include the cost of dismantling non-contaminated buildings.

She believes that utilities should begin setting aside money early in a reactor's life to prepare for its eventual dismantlement.

"If money is not collected from ratepayers during the years the plant produces power," said the author, "the bill will be charged to future customers or taxpayers who did not use the electricity."

Currently, nine states in the U.S. require utilities to make periodic deposits into external accounts for decommissioning purposes. They are California, Colorado, Maine, Massachusetts, Mississippi, New Hampshire, Pennsylvania, Vermont and Wisconsin. Michigan is the only state that doesn't allow recovery of decommissioning costs in current rates.

Consortium should be formed

Pollock suggests that an ad hoc consortium of international nuclear agencies undertake the dismantling of one or several large reactors that become ready for decommissioning in the next three decades to gain firsthand experience on the process.

She said, "The consequences of inadequate planning for decommissioning would be not only costly but dangerous."

Study says renewable energy industry thriving

WASHINGTON, D.C.—Despite falling oil prices, the renewable energy industry is here to stay, claims a new study from the Investor Responsibility Research Center (IRRC).

The report says small-scale power production has experienced a surge that, if sustained, may lead to the alteration of the way electric utilities obtain power for consumers.

According to *Power Plays: Profiles of America's Leading Renewable Electricity Developers*, 104 leading developers of six renewable technologies are currently predicting that they will install almost 14,534 MW of

capacity by 1990. The companies reported a total installed renewable generating capacity of 2,236 in 1984.

Company profiles

Profiles of the 104 renewable technology developers are included in the report. The technologies examined are biomass, geothermal, small hydro, photovoltaics, solar thermal and wind.

The IRRC report states that the Public Utility Regulatory Policies Act of 1978 and other government incentives for renewables have worked well.

"Indeed, in some ways," says the study, "these incentives seem to have worked better than the authors of PURPA could have suspected, setting in motion forces that could result in structural changes in the electric utility industry."

Production up since 1980

Excluding small-scale hydropower, the IRRC said recent Department of Energy figures show that electricity production from renewables grew 63.7 percent since 1980. In addition, found the report, renewable generation during the first nine months of 1985 was up 26.7 percent over the same period in 1984.

"IRRC's survey results indicate that this rapid growth can be expected to continue for at least the next several years as larger units come on-line—especially in the geothermal, hydro and biomass industries—and as wind farm developers continue to increase wind turbine capacity factors," said the report.

Waste-to-energy facilities are expected to be the fastest growing renewable energy source, says the study. Electricity from photovoltaics has the greatest long-run development potential.

"Renewable technologies face tremendous uncertainty in the next few years because of falling oil prices, the apparent loss of government tax credits, and Draconian cutbacks in

federal research and development support," says the IRRC report. "A shakeout has already begun among developers of some technologies and will obviously continue."

Some will survive

Developers with capital and superior technology will survive the shakeout and experience a rapidly growing market for their products in the 1990s, says the report.

IRRC said that the disappointments experienced by some of the technologies so far have been more a factor of energy markets not living up to earlier expectations than of failures to meet technological goals.

"In spite of the loss of tax credits and falling fuel prices, the companies involved in renewable energy development do not share the pessimistic outlook for renewable energy that characterizes some utility and government forecasts," says the report.

Even so, the report found that substantial commercial deployment of some technologies especially developing technologies like photovoltaics and solar thermal systems, will be delayed by uncertainties in energy markets and tax policies.

All regions involved

According to the report, all regions in the country are developing at least one of the six technologies examined

Continued on page 6

Technology	Number of active states	Total MW on-line or with firm plans	Three states leaders in developing technology (with % of total MW)
Waste-to-energy	23	1,664	New York (14.5%), Florida (14.5%), California (12.1%)
Landfill gas	7	44	California (47.5%), Wisconsin (22.7%), New York (20.4%)
Wood	8	771	California (55.9%), Maine (15.8%), Oregon (10.5%)
Geothermal	4	2,404	California (94.9%), Nevada (3.3%), Utah (1.7%)
Wind	7	1,474	California (96.5%), New York (1.2%), Hawaii (1.0%)
Hydro	18	716	Louisiana (26.9%), California (23.7%), New York (17.1%)
Photovoltaics	1	8	California (100%)
Solar thermal	1	211	California (100%)

Source: Investor Responsibility Research Center, Inc.

Editorial

Let's hope for a better 1986

Last year was, for the nation's largest electric utilities, the best of times and the worst of times. It was a year when some utilities were able to strengthen their financial foundations, adding the solidarity of real cash earnings to the paper profits reported over the past few years. But it also was a year when the "have-nots" in the industry, plus a few of the marginal "haves," slipped further into the financial shadows.

As is reported in this year's Top 100 Electric Utilities report (p.17), 1985 was the worst showing by the nation's biggest utility companies since *EL&P* began keeping score 21 years ago, back in 1966. Granted, revenues, which have managed to make solid and consistent gains over the period, did go up again. But the amount of the increase, 3.9 percent, was the lowest yet. And total net income available for common stock and average per-share earnings both fell—by 15 percent and 10 percent, respectively. For both, the net decreases represented firsts in the 21-year history of the report.

The performance of the Top 100 utilities in 1985 serves to further demonstrate the dual nature of the electric power industry...namely that some utilities have and the rest have-not. Those that have largely completed their construction projects, or at least the big vociferous, dollar-gulping nuclear and fossil generation expansion portions of them. They have received rate relief fairly recently and are maintaining a close rein on operating expenses. They are in growth areas or, at the worst, are in areas where load is not contracting.

Conversely, those that suffered the largest declines tend to be those utilities that demonstrate the reverse of those characteristics...namely large continuing generation construction projects (especially nuclear plants), reduced customer and load growth and general economic contractions, and little or no recent rate relief.

And as the old saying goes, "Them that have, get: them that don't, don't." Although this may always have been true to some degree, the worrisome fact is that the number in the latter category has been increasing each of the past three years.

On the positive side, however, many utilities have been able to reduce Allowances for Funds Used During Construction. This means the *quality* of earnings in such utilities are improved, since AFUDC does not generate any cash, but rather is only a paper profit. Also, some utilities without major construction programs have been recognized as "cash cows," utilities in an abnormally high cash-heavy position. But while these factors tend to mitigate against the overall poor showing of the industry, they apply to only a minority of companies. And for every company that has improved its performance, there is more than one that has slid further downhill.

Two conclusions can be drawn from the '85 performances of the Top 100 electric utilities. First, with stock prices generally above book value, most utilities are probably not as favorable an investment as suggested by analysts prior to the release of final 1985 figures, which may come back to haunt the industry in the year ahead. And two, barring a substantial change in conditions—a major surge in industrial activity, rate relief and/or a generally hot summer and cold early winter—the outlook for substantial reversal of the situation does not appear good.

In any case, for most companies on the Top 100 list, it looks like the rest of 1986 will be another time for economic belt-tightening.

Robert A. Lincicome, *EL&P* Editor-in-Chief

Half of '85 rate increase requests granted

BETHESDA, MD—State public service commissions approved 47 percent of the total amount of revenue increases requested by a representative sampling of utilities in 1985, says Regulatory Information Service.

It said the total amount of approved revenue increases in 1985 for its sampling was \$3.5 billion. The total requests amounted to \$7.4 billion.

RIS analyzed 112 energy and 55 telecommunications cases in 36 states. It said the information came from public records.

The average overall rate of return requested was 12.29 percent and the

average approved was 11.39 percent. For energy cases, averages of 12.49 percent and 11.75 percent were requested and approved.

RIS said return on equity (ROE) was, on average, 16.27 percent requested and 14.72 percent approved. Energy utilities requested an average ROE of 16.27 percent and received an average of 14.91 percent, or 91.6 percent of what was requested.

Entitled *RIS Analysis of Base Rate Cases Decided in 1985*, the 36-page report is available free from Regulatory Information Service, P.O. Box 30056, Bethesda, MD 20814.

KCPL dividend cut; Board announces recovery program

KANSAS CITY, MO—Kansas City Power & Light Company's Board of Directors announced May 6 that it was cutting the company's annual common stock dividend 15.25 percent to \$2.00 per share.

Due to a recent Missouri Public Service Commission rate decision, the board said immediate action must be taken to reverse the utility's eroding financial results.

The board stated, "This dividend reduction is part of an overall fiscal recovery program for KCPL, approved by the board and put into effect today."

In April the Missouri commission granted the company a seven year phase-in of \$78.2 million, plus carrying costs, for a total of \$120.1 million. KCPL had requested \$194.7 million on a one-time basis, or a four-year phase-in of \$237.6 million.

Included in the rate order was a \$126 million rate base disallowance of the utility's 14 percent investment in the Wolf Creek nuclear plant, due to alleged unreasonable cost increases and imprudent management of the project.

In addition, the MPSC determined that 75 percent of the plant represents excess capacity. The commission said the company would be allowed to earn only one-half of the 15 percent equity return on that portion of the plant, while the remaining 25 percent will earn the full return.

KCPL said its fiscal recovery pro-

gram will include:

- * an average 23.5 percent cut in construction budgets through 1988.
- * an average annual 7.7 percent cut in its operations and maintenance budgets through 1988.
- * a hiring freeze.
- * a curtailment of travel.
- * a 75 percent reduction in advertising expenses.
- * elimination of all charitable contributions from KCPL stockholder funds.
- * withdrawal of the company's membership support in numerous civic groups, service clubs, economic development activities and electric industry associations.

KCPL's Chairman, President and CEO Arthur J. Doyle said, "Although there can be no assurances, the board believes that, with our fiscal recovery program in place, KCPL will be able to maintain this reduced level of common stock dividends and, hopefully, with our ongoing efforts to secure further additional rate relief, KCPL will be able to start increasing them at an early date."

Moody's Investors Services confirmed its credit ratings on the utility's securities. The company's ratings were placed on special review Dec. 20, 1985.

The agency said it believes that the MPSC rate decision will not allow the company to achieve significant strengthening in its financial position over the next several years.

FASB holds hearing on FAS 71 draft

STAMFORD, CT—More than 70 organizations and individuals will testify at a public hearing here June 4-6 on the Financial Accounting Standards Board proposal (FAS 71) that would require several accounting changes for electric utilities.

The FASB said it is the largest number ever to request time to testify at one of its hearings. Standards issued by the Board are recognized as authoritative by the Securities and Exchange Commission.

The subject of this month's hearing is an exposure draft issued December 1985 that deals with deferred costs under "phase-in" plans for recovery in future years of part of current costs related to new plants. Also, the draft addresses probable future revenue expected to result from the cost of abandoned plants for ratemaking purposes and disallowed costs of new plants.

"The purpose," said FASB Chairman Donald J. Kirk, "is to improve the usefulness and reliability of financial reports for those who base investment credit decisions on them. This is

a technical task that cannot be accomplished by popular vote any more than establishing safety standards for nuclear plants can be."

Kirk said the Board is not persuaded "either by rhetoric or by the numbers of people who are for or against a given proposal."

He noted that some utilities have had letter writing campaigns to influence the Board. Kirk said nearly 80 percent of the comments received to date are from letters.

Correction

Georgia Power Company mistakenly listed its 1984 heat rate for the McDonough plant in a form used by the Utility Data Institute for the May 1986 *EL&P* article on the "Top Twenty Heat Rates" on page 19. The plant's heat rate was 9665 Btu/kWhr, dropping it to 30th place. The change means that Pennsylvania Electric Company's Conemaugh plant (9542 Btu/kWhr) now occupies the 20th place on the list.

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A company of
The Dun & Bradstreet Corporation
Barrington, IL 60010 • (312) 381-1840

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Duquesne Lt. cuts dividend; drops Perry 2 interest

PITTSBURGH—Hard hit by economic problems in its western Pennsylvania service area, Duquesne Light announced in April it was cutting its annual common stock dividend from \$2.06 per share to \$1.20.

In addition, the utility announced plans to close a generating station and pull out of its commitment to the Perry 2 nuclear unit in Ohio.

Company President Wesley W. von Schack cited unprecedented electric sales losses as the main reason for the actions. "In 1986, we face our lowest projected sales level in 15 years," he said. "In the past five years, industrial sales are down approximately 50 percent and overall sales are down 20 percent."

Duquesne Light had announced in February several cost-cutting measures and plans to reduce utility personnel. The measures included hiring freezes, wage reductions for top management, budget cutbacks and a lay-off of 100 employees.

He said the company is reducing its common stock dividend to minimize external financing and forego further dilution of earnings. Duquesne Light also retired \$173 million in high yielding debt.

According to von Schack, the utility has the second highest rates in Pennsylvania. He announced rate phase-in plans for the company's interest in the Perry 1 and Beaver Valley 2 nuclear units.

No plans for Perry 2

As for Perry 2, which is jointly owned by members of the CAPCO power pool, von Schack said the company believes that there are no plans to resume construction on the partially completed plant.

"Since we no longer need the capacity of Perry 2," he stated, "we will petition the PUC to recover our \$160 million investment over a 10-year period."

The company will file for a "de fac-

to" abandonment of its interest in the unit. Duquesne Light has a 13.74 percent share in the plant.

Also, the utility will close its 325 MW Phillips coal-fired station in late 1986 or early 1987.

Recovery plan announced

Von Schack presented a six-part program called the "Duquesne Plan" that the utility hopes will help in accelerating the economic recovery of the Pittsburgh area.

The six areas of focus are: 1) long-range rate stabilization, 2) marketing and economic development, 3) reshaping the company, 4) improve financial conditions, 5) assistance for financially troubled customers, and 6) stockholder interest.

Duquesne Light will form a new marketing department to help in bringing new jobs to the area. It also plans to offer special economic development incentive rates for new and existing industrial customers.

The company has established several programs to help with assistance for financially troubled customers. Since 1981, Duquesne Light said it has seen a 13 percent increase in the number of delinquent customers and a 45 percent rise in the dollar amount on delinquent accounts.

"Although we are not, and cannot become a social service agency," he stressed, "it is in our own and the community's best interest for us to seek solutions for our own customers genuinely unable to pay for electricity."

In order to search for new investments, the company is studying the possibility of forming a holding company.

Research shows hydrogen peroxide a key in acid rain

ARGONNE, IL—Scientists at DOE's Argonne National Laboratory now believe that hydrogen peroxide in the air plays a major role in creating acid rain.

"We have found that 40 percent or more of the sulfate acidity in summer rains in the Northeast comes from reactions of sulfur dioxide with hydrogen peroxide," said Argonne's Ben Holt.

Hydrogen peroxide is naturally present in the air in low concentrations. He said it reacts with sulfur dioxide to form sulfate, a major component of acid rain.

New methods needed

Holt reported that Argonne's work "suggests that controlling hydrogen peroxide could provide an additional way to help control acid rain. Since this is a relatively new idea, methods would have to be devised for detecting and controlling hydrogen peroxide sources."

Argonne's scientists also have developed a way to accurately measure small amounts of hydrogen peroxide in rainwater. According to Holt, the method can also be used to study the role of hydrogen peroxide in making sulfates.

"For example," he said, "we can compare rain upwind and downwind of power plants, urban areas or electrical storms."

After examining summer rain samples collected near Chicago; Dearborn, MI; Whiteface Mountain, NY; and Durham, NC, researchers found that sulfates in rainwater were formed by both hydrogen peroxide and oxidation in the air.

Argonne's research was funded by the U.S. EPA and DOE's Office of Energy Research.

Who can help you see streetlighting conversion in a better light?



Utilities have been faced with a big problem in converting mercury or incandescent streetlighting systems to brighter, more energy efficient high pressure sodium (h.p.s.). Until now, the only way to do that has been to replace existing luminaires with new.

Unfortunately, the initial cost for new luminaires and installation labor often extends payback beyond acceptable limits.

Universal's H.P.S. Retrofit Ballast Kit changes that.

Now, instead of replacing the luminaire, you simply replace the old ballast and lamp with our ballast kit and an h.p.s. lamp. It only takes minutes. Your maintenance people

can perform the conversion on the pole or in your shop. Because you use your existing luminaires, you gain a substantial immediate savings.

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cobra head, power door, NEMA head and just about every type of luminaire. If we don't have a kit for yours, we'll design one very quickly. And we back every kit with a full 2-year warranty.

That's why so many utilities have specified Universal's Retrofit Kits when they upgraded their streetlighting.

If you want to see streetlighting conversion in a better light, call (201) 967-7939. Or write Dept. U, Universal Manufacturing Corp., P.O. Box 3028, Paterson, NJ 07509.

UNIVERSAL

Inquire R.S. 1

Renewable energy . . from page 3

in the report. Nearly two-thirds of the capacity under development or operating in the U.S. is sited in California (see table).

"Continued growth of non-utility power generation is likely to add to the growing pressure for deregulation of all electric power generation," concludes the report. "Utilities that recognize the changing nature of their business and properly adjust their business strategies to these new conditions will prosper at the expense of their less forward-looking peers."

The IRRRC is an independent non-profit research organization. For more information on the report, call the group at (202) 939-6500.

New York City residents pay most for power, says NARUC

WASHINGTON, D.C.—The nationwide average cost of electricity is 8.22 cents per kilowatt-hour (kWh), according to a survey by the National Association of Regulatory Utility Commissioners.

In its seventh annual summer residential electric bill survey, NARUC said typical residential bills vary by almost 450 percent depending upon the service territory in which the consumer is located.

Customers in Lewiston, ID, the least expensive territory, pay about 3.62 cents per kWh. New York City consumers pay the most for electricity, 15.46 cents per kWh. (See table.)

Report contains comparisons

NARUC's report contains summer 1985 residential electric bill comparisons for the largest service territories of the major investor-owned electric utilities. Residential electric bills for June, July and August of 1985 were reported to the association for three different levels of energy consumption—250-kWh, 500-kWh and 750-kWh.

Other high bills were paid by resi-

dents of Kahului, HI (14.12 cents); Long Beach, NY (13.70 cents); and Nantucket, MA (13.64 cents).

NARUC reported low bills in Spokane, WA (3.68 cents); Ontario, OR (3.85 cents); and Yakima, WA (4.00 cents).

Bills increased 2.5 percent

According to the survey, residential electric bills increased approximately 2.5 percent over the previous year's survey. The Consumer Price Index jumped about 3.5 percent during the same period.

The study shows that consumers in 19 service areas pay in excess of 11 cents per-kWh; and customers in 22 territories pay less than 6 cents.

NARUC said a regional analysis of the bills show that rates in the Northeast and Pacific regions were the most expensive, while those of the Northwest and Rocky Mountain regions were least expensive.

A copy of the 218-pp. report may be obtained from NARUC, P.O. Box 684, Washington, D.C. 20044 for \$16 per copy. For more information, contact NARUC at (202) 898-2200.

10 MOST EXPENSIVE COMPANIES					
Company	City	State	Total bill*	Avg. cost cents/kWh	Rank
Consolidated Edison Co. of N.Y.	New York	New York	\$231.95	15.46	1
Maui Electric Co.	Kahului	Hawaii	\$211.78	14.12	2
Long Island Lighting Co.	Long Beach	New York	\$205.56	13.70	3
Nantucket Electric Company	Nantucket	Massachusetts	\$204.85	13.64	4
Orange & Rockland Utilities, Inc.	Middletown	New York	\$202.59	13.51	5
Hawaii Electric Light Co.	Hilo	Hawaii	\$200.82	13.37	6
San Diego Gas & Electric Co.	San Diego	California	\$195.00	13.00	7
Central Hudson Gas & Elec. Corp.	Poughkeepsie	New York	\$184.95	12.33	8
Rockland Elec. Co.	Ramsey	New Jersey	\$183.15	12.21	9
Jersey Central Power & Light Co.	Dover	New Jersey	\$179.13	11.84	10

10 LEAST EXPENSIVE COMPANIES					
Company	City	State	Total bill*	Avg. cost cents/kWh	Rank
Washington Water Power Co.	Lewiston	Idaho	\$54.20	3.62	199
Washington Water Power Co.	Spokane	Washington	\$55.20	3.68	198
Idaho Power Co.	Ontario	Oregon	\$57.78	3.85	297
Pacific Power & Light	Yakima	Washington	\$60.04	4.00	196
Montana Power Co.	Billings	Montana	\$61.40	4.09	195
Idaho Power Co.	Boise	Idaho	\$62.19	4.15	194
CP National Corp.	La Grande	Oregon	\$66.18	4.41	193
Portland General Elec. Co.	Portland	Oregon	\$70.19	4.68	192
Puget Sound Power & Light Co.	Bellevue	Washington	\$71.40	4.76	191
Pacific Power and Light Co.	Kalispell	Montana	\$72.02	4.83	190

*Total bill equals total cost of 500 kWh per month for June, July & August.
Source: NARUC's Seventh Summer Residential Electric Bill Survey

PG&E plans large solar project



An artist's conception illustrates the variety of photovoltaic solar systems that Pacific Gas & Electric Company plans to use in an \$80 million project designed to develop large-scale applications of the technology.

SAN FRANCISCO—Pacific Gas & Electric Company (PG&E) remains confident that solar power has a bright future.

PG&E Counsel John A. Vance testified before a congressional subcommittee in April in support of a two-phase \$80 million project to develop technology for large-scale applications of photovoltaic power.

Congressional approval is required for Department of Energy financial participation in the first phase of the proposed 10-year project. Sites would be located in Davis, CA and San Luis Obispo, CA. PG&E and Bechtel National, Inc. plan to fund the project with DOE. The utility is seeking additional participation from the California Energy Commission,

the Electric Power Research Institute and other utilities.

The proposed project would develop 10,000-kW of electricity for the PG&E grid. Construction of the \$40 million first phase is expected to be completed by 1989 and will be capable of generating 3,500-kW. Phase two, scheduled for full operation by 1995, will include systems capable of generating 6,500-kW.

Grant Horne, PG&E vice president of corporate communications, said, "Energy planners must look beyond today's realities. The lesson of the 1970s and early 1980s is that oil and natural gas market conditions can change quickly. This project is part of a prudent plan to provide options for energy supply in the future."

Merrick Corp. and Penn Crusher consolidate

BROOMALL, PA—The Merrick Corp., a subsidiary of Penn Virginia Corp., has consolidated with its sister subsidiary Pennsylvania Crusher Corp.

Pennsylvania Crusher Corp. President John D. Whalen believes, "this consolidation will bring together a team of highly respected marketing,

technical and managerial talents."

All Merrick departments in New Jersey will be relocated here at the Pennsylvania Crusher facilities.

The Merrick product line will still be marketed under the Merrick name and Merrick customers will continue to be serviced through established channels.

Utility directorship report now available from Stone and Webster

NEW YORK—Utility board members were paid a median annual retainer of \$6,000 last year, according to a recent survey from Stone & Webster Management Consultants, Inc.

The report is based on a nationwide survey of 119 utilities providing information on 1,298 board members. Fee schedules for board membership, comprising annual retainers; fees for board meetings and committee meetings; and, total cash compensation are all compared in terms of company size, type and geographic region.

The 119 utilities consisted of 22 holding companies, 38 electric companies, 29 electric & gas companies, 22 gas distribution companies, 2 gas transmission companies and 6 integrated gas companies.

The survey, taken in the fourth quarter of 1985, showed that participants paid board members a median board meeting fee of \$500 and a median committee meeting fee of \$400. Median annual total cash compensation (retainer plus meeting fees) was reported to be \$11,000. It was also found that company size influenced

the compensation package provided to outside directors.

According to the report, operating revenues ranged from \$17 million to \$5 billion, with 26 percent of the participants reporting revenues between \$200.1 and \$500 million.

Directors' Compensation

Stone & Webster reported that 82 percent of the participants use an annual retainer and meeting fee schedule (board and committee) to compensate their directors. Only six utilities reported that they did not pay an annual retainer, but rely on board and committee fee schedules.

Of the 119 utilities, 77 percent said they do not provide additional compensation to their inside directors for board membership. Of the companies that do provide compensation, the majority utilize the meeting and fee schedule and not an annual retainer, said the report.

The report is available for \$495. For more information, contact Victor R. Desposito, Jr. at (212) 290-7057 or Michael Lazorchak at (212) 290-7056.

Lignite-fired plant begins operation

PINEVILLE, LA—Central Louisiana Electric Company's Dolet Hills Unit 1 lignite-fired generating plant began commercial operation in late April.

The 640 MW plant was completed on schedule for \$268 million, \$6 million under budget. CLECO said the installed cost of the unit was \$838 per kilowatt.

Largest construction program

"The commercial operation of Dolet Hills marks the completion of the largest construction program in CLECO's history and represents a milestone in our fuel diversification program," said CLECO President and CEO William F. Terbot. "This program is designed to reduce the company's dependence on higher, less-stable priced natural gas, while also avoiding the high cost of nuclear generation."

With the new plant, the utility noted that it will be meeting about 50 percent of its fuel needs with coal and

lignite. Before 1982, the company used only natural gas and oil.

Fuel costs less

"Fuel cost for lignite-fired Dolet Hills is about \$1.20 per MMBTU, which is substantially less than our current cost of gas generation," explained Terbot. "We estimate Dolet Hill's first year of operation will result in approximately \$34 million in fuel cost savings to the company's customers by allowing us to displace gas-fired generation."

Ample reserves

CLECO will operate the plant, which is a mine-mouth operation. Along with a neighboring utility, CLECO holds the rights to an estimated 150 million tons of lignite reserves. According to the utility, the reserves are enough to support two of the 640 MW units for 30 years.

Terbot said that approximately 300 new jobs would be created by the plant's operation.

21st Annual Top 100 Electric Utilities Report

1985 financial performance was worst since EL&P started Top 100 record-keeping in 1966

Robert A. Lincicome
EL&P Editor-in-Chief

The five year financial recovery of the nation's largest investor-owned electric utility companies skidded to a virtual halt in 1985. While the Top 100 electric utilities collectively eeked out a small gain in total revenues, net income and average earnings per share fell.

It was the most dismal year for the Top 100 electric utilities, collectively, since EL&P launched the annual Top 100 series 21 years ago.

Although total corporate revenues climbed to \$149.8-billion, an increase of 3.9 percent, after-tax income declined almost 15 percent, or \$2.5-billion, and average per-share earnings for the 99 reporting companies dropped 30-cents per share, or nearly 10 percent from a year ago.

Three causes

Three factors were responsible for the disappointing performance.

First, utilities burdened with cancelled nuclear facilities took huge write-offs following adverse regulatory decisions absolving their customers of responsibility for payment

of costs of the abandoned facilities.

Second, kilowatthour sales for many companies were disappointing as milder-than-normal weather prevailed for most of the year and the healthy economic recovery everyone expected never really got up to speed. This was especially true for utilities with normally large heavy-industry load.

Third, the effect of rate relief was generally less in 1985 than in the previous few years as reduced inflationary pressures and increased revenues generally decreased both the number of rate relief requests and the amounts granted by regulatory commissions.

Performance summary

During 1985, total revenues of the nation's Top 100 electric utilities increased 3.9 percent, one of the smallest revenue increases in more than a decade. Revenues climbed to \$149.8-billion, compared with revenues of \$144.3-billion in 1984.

The revenue increase came on an increase in kilowatthour sales of 1.6 percent, to 2.0 trillion kWh. The primary cause of this increase was a 6-percent gain in commercial sales.

But net income available for shareholders fell almost 15 percent, to \$14.2-billion from \$16.7-billion in 1984. Although most income performances generally were off during 1985, the sharp decline in total income available for common stock, the first in the 21-year history of the Top 100 series of reports, came as a result of massive write-offs taken by utilities that had cancelled nuclear programs.

Earnings per average common share, similarly, suffered from the nuclear plant write-offs, decreasing 30 cents per share, or 9.6 percent, to \$2.84 per share. However, removal of just the two major earnings losers (Public Service of Indiana and Consumers Power) from the earnings of the 99 reporting companies allowed average earnings to eek out a tiny gain. For the 97 remaining companies, average earnings climbed to \$3.19 in 1985, compared with \$3.18 a year earlier.

Long-term debt increased in 1985 to \$150-billion, up 7.3 percent from 1984. Eighty companies increased their total long-term debt, while 29 reduced debt. The portion of net plant covered by debt remained almost the

same as in 1984, at 46.6 percent. Forty-two companies increased the percentage of net plant covered by long-term debt during 1985.

Electric customer growth by the Top 100 electric utilities was 2.6 percent in 1985, to 76.2 million, from 74.7 million in 1984. Gas customers of combination companies grew at a faster rate, 5.3 percent, to 17.3 million.

Despite the 2.6 percent growth in electric customers, kilowatthour sales by the Top 100 electric utilities increased only slightly, climbing to 1.99-trillion kWh, a gain of just 1.6 percent, from the 1984 total of 1.96-trillion.

Although 69 companies increased kWh sales in 1985, the gains generally were small. Only 14 companies posted sales gains greater than the historic 7-percent average rate enjoyed by the entire industry prior to the Arab Oil Embargo. While the largest of these was a healthy 36.3 percent (Tucson Electric Power), the median growth was just 2.1 percent, down more than 34 percent from 1984.

There were only small changes among the rankings of the largest sellers of electricity (see Table 1). Southern California Edison, 5th in

EARNINGS GROWTH STATISTICS

Company	Rank	% Change From 1984	1985 Earnings Per Share, \$	1984 Earnings Per Share, \$
Long Island Lighting	6	28.48	3.97	3.09
Washington Water Power	7	23.17	3.03	2.46
FPL Group (FPL)	8	18.70	3.11	2.62
Minnesota Power	9	15.02	4.67	4.06
Houston Industries	10	14.81	4.42	3.85

San Diego Gas & Electric	16	7.97	3.25	3.01
United Illuminating	17	7.78	5.82	5.40
Southern Company	18	6.67	3.20	3.00
Hawaiian Electric	19	6.67	2.40	2.25
Midwest Energy	20	6.34	2.85	2.68

Detroit Edison	26	5.91	2.33	2.20
Central & South West	27	5.87	3.61	3.41
Southwestern Public Service	28	5.84	2.72	2.57
Central Hudson Gas & Electric	29	5.42	4.67	4.43
Delmarva Power & Light	30	4.94	2.76	2.63

Utilicorp United	36	3.68	3.10	2.99
Wisconsin Power & Light	37	3.40	4.26	4.12
Southern California Edison	38	2.52	3.26	3.18
Duquesne Light	39	2.26	2.26	2.21
Northern States Power	40	2.24	5.93	5.80

Central Louisiana Electric	46	0.83	3.65	3.62
Union Electric	47	0.70	2.86	2.84
Savannah Electric & Power	48	0.69	2.90	2.88
Pacificorp	49	0.58	3.44	3.42
Commonwealth Edison	50	0.45	4.45	4.43

Company	Rank	% Change From 1984	1985 Earnings Per Share, \$	1984 Earnings Per Share, \$
Central Illinois Light	56	-1.06	2.79	2.82
Iowa-Illinois Gas & Electric	57	-1.45	4.07	4.13
Kansas City Power & Light	58	-1.56	4.41	4.48
Rochester Gas & Electric	59	-1.65	3.58	3.64
Ohio Edison	60	-2.00	2.45	2.50

Toledo Edison	66	-4.32	3.54	3.70
Northeast Utilities	67	-4.56	2.72	2.85
Consolidated Edison	68	-4.91	4.28	4.48
Philadelphia Electric	69	-5.19	2.56	2.70
Commonwealth Energy	70	-5.26	4.50	4.75

Oklahoma Gas & Electric	76	-6.88	2.30	2.47
Empire District Electric	77	-7.09	2.75	2.96
Scana Corp.	78	-7.54	2.82	3.05
Sierra Pacific Resources	79	-7.58	1.95	2.11
Gulf States Utilities	80	-8.70	2.10	2.30

Louisville Gas & Electric	86	-16.89	3.15	3.79
American Electric Power	87	-17.36	2.19	2.65
Idaho Power	88	-17.87	2.16	2.63
Public Service of New Hampshire	89	-18.57	2.50	3.07
Public Service of Colorado	90	-29.02	1.81	2.55

Central Maine Power	96	-95.98	0.08	1.99
Northern Indiana Public Service	97	-114.20	-0.23	1.82
Consumers Power	98	-487.72	-4.42	1.14
Public Service of Indiana	99	-2285.85	-23.17	1.06
Centel	100	NA	NA	NA

SALES DATA

Company	1985 Total Sales (KWH)			1985 Sales (KWH)				Average Annual Residential Use		Ratio of Long-Term Debt to Net Plant	
	Rank	% Increase	Average Annual Growth 1980-1985	By Type of Customer (% of Sales)				1985	1984	1985	1984
				Resid.	Comm.	Indus.	Other				
New York State Electric & Gas	6	13.7	2.77	28.1	16.3	17.1	38.5	7,387	7,426	51.9	50.4
Southwestern Public Service	7	12.3	4.23	13.0	14.2	37.2	35.5	7,574	7,630	39.5	41.0
Boston Edison	8	12.2	-0.22	22.0	45.5	13.8	18.7	5,512	5,551	41.4	40.1
Pacificorp	9	11.0	1.24	25.6	19.9	28.1	26.4	12,287	12,289	51.4	52.2
Kentucky Utilities	10	10.5	-1.65	31.2	21.0	19.1	28.7	10,591	10,873	34.5	37.8
Dominion Resources	16	6.2	-0.04	34.9	26.7	17.0	21.3	11,376	11,181	49.7	50.1
Middle South Utilities	17	6.2	-0.78	29.8	20.0	37.7	12.6	11,828	11,307	47.1	51.3
Texas Utilities	18	6.1	3.63	33.1	27.7	28.5	10.6	13,062	12,887	36.8	37.4
El Paso Electric	19	6.0	1.65	25.2	28.1	16.3	30.4	5,735	5,755	49.6	46.9
Nevada Power	20	5.4	3.42	42.9	2.8	47.5	6.7	13,805	13,812	32.6	44.3
Scana Corp.	26	3.6	1.32	30.9	25.7	33.6	9.7	11,992	12,061	35.5	40.7
Utah Power & Light	27	3.6	4.09	18.9	15.8	37.4	27.9	8,208	8,268	40.8	42.9
Public Service of New Hampshire	28	3.4	1.96	28.0	12.2	28.9	30.8	6,989	7,067	45.6	47.3
Florida Progress (FPC)	29	3.3	1.25	43.1	24.0	14.9	18.0	10,940	10,638	37.6	43.0
Public Service of New Mexico	30	3.3	6.67	17.7	23.7	10.6	47.9	5,925	6,022	49.7	46.9
Delmarva Power & Light	36	2.7	2.27	26.5	25.4	30.6	17.6	8,059	8,283	47.1	42.2
Dayton Power & Light	37	2.6	1.05	35.1	22.0	32.3	10.5	9,599	9,786	104.3	49.5
Southern California Edison	38	2.6	1.13	28.6	39.9	22.1	9.4	6,099	6,147	46.2	44.9
Washington Water Power	39	2.6	0.65	34.2	20.3	13.4	32.1	14,997	14,854	45.5	49.8
Iowa Resources	40	2.6	0.75	36.7	24.9	32.8	5.6	8,295	8,515	45.9	46.2
Detroit Edison	46	2.3	0.97	27.5	19.4	45.3	7.8	6,165	6,253	43.8	47.6
Pacific Gas & Electric	47	2.2	1.73	32.5	33.1	26.3	8.0	6,533	6,557	60.3	78.0
Iowa Electric Light & Power	48	2.2	0.58	33.0	25.6	33.2	8.3	7,891	8,116	38.0	33.6
Utilicorp United	49	2.2	1.25	38.6	25.9	20.3	15.3	8,369	8,550	42.2	35.7
Caroline Power & Light	50	2.1	1.18	25.2	18.2	32.7	23.9	11,522	11,891	41.8	40.6
Montana Power	56	1.0	-0.43	24.7	33.4	17.7	24.2	9,267	9,053	48.0	48.7
Kansas City Power & Light	57	1.0	0.50	29.9	42.2	25.3	2.6	8,197	8,327	46.7	46.4
Northeast Utilities	58	0.9	0.83	36.3	33.2	24.5	6.1	7,492	7,596	45.2	45.9
Commonwealth Edison	59	0.8	0.35	28.0	32.8	27.8	11.5	6,458	6,583	37.1	40.5
Wisconsin Electric Power	60	0.7	1.00	29.7	26.1	33.6	10.6	7,367	7,331	42.1	38.2
MDU Resources Group	66	0.3	3.85	40.4	24.8	31.1	3.7	7,788	7,866	38.7	41.9
Cleveland Electric Illuminating	67	0.3	-0.98	25.5	26.1	46.1	2.4	6,567	6,646	44.1	44.6
Long Island Lighting	68	0.1	0.63	42.6	52.6	0.0	4.8	7,018	7,136	37.2	35.7
Toledo Edison	69	0.0	1.16	25.2	19.0	45.4	10.3	7,770	8,045	130.3	108.2
Midwest Energy	70	-0.1	-0.66	31.3	27.0	24.3	17.5	7,267	7,166	47.3	47.6
Central & South West	76	-0.8	0.64	28.0	23.1	32.7	16.2	10,208	9,902	45.8	37.4
Central Maine Power	77	-0.9	6.20	33.9	22.0	42.0	2.2	7,013	7,109	52.3	54.4
Iowa-Illinois Gas & Electric	78	-1.3	0.45	23.4	26.7	43.0	6.9	6,040	6,166	36.0	35.2
Interstate Power	79	-1.8	0.87	23.3	18.7	51.7	6.2	7,127	7,132	48.7	47.4
Public Service of Indiana	80	-1.9	-0.36	27.5	21.9	35.7	14.9	10,347	10,843	76.3	74.3
Central	86	-3.9	-1.25	28.0	28.7	21.8	21.6	6,886	6,794	0.0	0.0
Central Illinois Public Service	87	-4.1	-0.29	26.9	11.6	40.5	21.0	8,351	8,593	39.7	39.8
Northern Indiana Public Service	88	-4.2	-0.64	17.6	3.9	75.3	3.2	6,531	6,670	48.4	44.4
New England Electric	89	-4.3	2.98	35.1	31.7	26.1	8.0	6,302	6,323	53.7	56.3
Philadelphia Electric	90	-4.3	1.28	30.0	13.3	53.0	3.7	6,820	6,960	47.4	44.7
Central Hudson Gas & Electric	96	-6.4	2.99	24.7	23.7	26.9	22.7	6,254	6,389	119.8	97.8
Southern Indiana Gas & Electric	97	-10.3	1.03	24.4	19.4	38.1	18.0	10,596	10,704	37.2	45.2
American Electric Power	98	-10.5	0.15	22.7	15.5	35.6	26.2	10,014	10,023	53.9	52.9
Minnesota Power	99	-11.2	0.90	10.0	8.8	66.0	15.1	8,123	8,014	51.8	51.4
Kansas Power & Light	100	-63.5	35.15	21.7	26.2	20.2	31.9	7,864	7,971	33.9	35.9

1984, replaced neighboring Pacific Gas & Electric in fourth place, and Middle South Utilities moved from ninth to seventh.

Commercial (and small power) sales gained the most during the year, climbing 6.0 percent to 498.9 billion in 1985, compared with 470.7-billion a year earlier. "Other" sales, including sales for resale, also increased healthily, from 298.3 billion to 313.6 billion, a gain of 5.1 percent.

Industrial (and large power) sales meandered along all year, but the expected increase from the continuing recovery of the economy in general never got off the ground. Companies in what has become known as the

TABLE I
THE TOP 10 IN KWH SALES

1	1 Southern Company	126,057	10.1
3	3 Texas Utilities	73,370	6.1
5	4 Pacific Gas & Electric	64,728	2.2
7	9 Middle South Utilities	56,263	6.2
9	7 Houston Industries	55,969	(6.3)

Rust Belt, such as Duquesne Light and American Electric Power, were especially hard hit. But most other utilities also suffered reductions in industrial and large power sales. Overall, industrial sales declined 3.5 percent, from 632.2 billion in 1984 to 610.0 billion last year.

Residential usage inched up 1.8 percent, fractionally lower than the growth in number of customers, and well below the gain registered in 1984. Average residential use of electricity decreased from a record 8688 kWh in 1984 to 8651 kWh in 1985. As in the past, the companies recording the highest residential usages were located in the Pacific Northwest, where power rates are relatively low, and in the areas where summer temperatures and humidities make air conditioning essential to comfort.

Leaders were 1. Idaho Power, 15,432 kWh; 2. Washington Water Power, 14,997 kWh; 3. Puget Sound Power & Light, 14,252 kWh; 4. Nevada Power, 13,805 kWh and 5. Texas Utilities, 13,062 kWh.

Conversely, utilities at the other end of the residential-usage scale, those posting the smallest use by their customers, tended to be in high-cost areas. Companies posting the lowest residential usages in 1985 were: 96. Eastern Utilities Associates, 5582 kWh; 97. Boston Edison, 5512 kWh; 98. Public Service Electric & Gas, 5494 kWh; 99. San Diego Gas & Electric, 5413 kWh and 100. Consolidated Edison, 3386 kWh.

Revenue gains

Total revenues of the Top 100 investor-owned electric utilities increased just 3.9 percent in 1985, a substantial drop from a year ago when gains of 15.7 were posted. As mentioned above, the reduced growth rate reflects both the slower growth in kWh sales and reduced rate relief by regulatory agencies.

The total posted by the Top 100 includes revenues from all sources, including those of non-regulated sub-

sidiaries of holding companies and totalled \$149.9-billion, compared with \$144.3-billion in 1984.

Revenues from electric operations increased 4.6 percent, to \$128.8-billion from \$123.2-billion a year earlier. At the same time, combination companies posted gas revenues of \$17.9-billion, down 2.8 percent from 1984, when they registered gas revenues of \$18.4-billion.

Gains in "Other" revenues were the highest, at 15.4 percent, reflecting increased efforts by utilities to diversify. Other revenues totalled \$3.1-billion in 1985, compared with \$22.7-billion in 1984.

Interestingly, total revenues of hold-

**TABLE II
THE TOP 10
TOTAL REVENUES**

1	1	Pacific Gas & Electric	\$8,431	7.7
3	3	Consolidated Edison	5,498	(4.0)
5	5	Commonwealth Edison	4,964	0.7
7	7	Public Service Electric & Gas	4,409	5.1
9	9	Texas Utilities	4,170	5.1

ing companies held almost constant in 1985 with those for 1984, increasing just 0.6 percent to \$46.7-billion from \$46.4-billion in 1984.

Operating electric and combination companies without holding company relationships performed better than holding companies. Revenue gains for those companies without holding company relationships were 5.3 percent, to \$103.1-billion from \$97.9-billion in 1984.

Twenty-six companies on the 1985 Top 100 list are holding companies, the same as a year ago.

Thirty-five companies reported declines in revenues in 1985, including 19 that encountered kWh sales decreases.

The largest revenue gains were posted by Public Service of New Mexico (+68.2 percent) on the strength of higher rates and a small increase in kWh sales, Tucson Electric Power (+27 percent) as a result of a healthy 36.3 percent sales gain, the highest among the Top 100 electric utilities; and Pennsylvania Power & Light, (+26.5 percent), on the basis of increased kWh sales, largely to other utilities.

Companies at the opposite end of the scale were: 98. Boston Edison (-8.6 percent), despite a relatively strong sales showing that ranked it seventh among the Top 100; 99. Illinois Power (-8.8 percent), after a 6.7 percent decline in kWh sales and 100. Central Illinois Light (-9.5 percent), on reduced kWh sales.

A total of 47 utilities enjoyed revenues in excess of \$1-billion, one less than in 1984. The ten largest revenue producers are shown in Table II, which reflects only a switch in the rankings of two companies.

Net incomes down

For the first time in the 21 year history of the Top 100 report, net income available for common stock declined, falling 14.8 percent to \$14.23-billion from \$16.71-billion in 1984. The decline was primarily due to the large

FINANCIAL STATISTICS

Company	Net Income		Revenue		Sales (KWH)		Int. Cov. Ratio		Earnings Per Share \$ 1985	Price/Share 1985 (Dollars)		% Change Long-Term Debt '84-'85
	Rank	% Gain	Rank	% Gain	Rank	% Gain	1985	1984		High	Low	
Public Service of New Mexico	6	33.1	1	68.2	30	3.3	1.01	0.87	3.30	30.750	23.875	9.33
Long Island Lighting	7	29.5	47	3.0	68	0.1	1.35	1.23	3.97	9.375	5.750	17.36
Washington Water Power	8	28.2	14	11.2	39	2.6	1.51	1.16	3.03	25.125	18.500	-2.44
Houston Industries	9	26.0	80	-2.9	92	-6.3	2.03	1.50	4.42	29.500	21.750	11.68
FPL Group (FPL)	10	23.0	16	10.4	24	4.2	1.19	0.97	3.11	29.000	20.500	-2.36
Duquesne Light	16	14.7	51	2.4	31	3.2	1.01	0.98	2.26	17.500	14.125	9.45
Carolina Power & Light	17	14.3	41	4.3	50	2.1	1.42	1.36	3.86	30.875	24.125	18.59
Niagara Mohawk Power	18	14.1	85	-3.3	3	15.5	1.32	1.30	2.88	21.875	16.375	10.14
Toledo Edison	19	13.0	21	8.0	69	0.0	1.12	1.19	3.54	22.125	16.500	20.64
Public Service Electric & Gas	20	12.7	36	5.1	45	2.3	1.67	1.54	3.96	33.125	25.375	1.98
United Illuminating	26	11.0	61	1.1	55	1.3	0.91	1.36	5.82	27.125	13.750	16.96
Hawaiian Electric	27	10.5	88	-3.7	64	0.4	1.39	1.32	2.40	25.375	19.625	2.14
Commonwealth Edison	28	10.3	63	0.7	59	0.8	1.28	1.18	4.45	32.875	27.000	0.30
Tucson Electric Power	29	10.3	2	27.0	1	36.3	5.19	8.30	4.35	45.500	32.375	16.93
Central Vermont Public Service	30	9.7	19	9.6	93	-6.4	2.34	2.61	3.39	22.125	16.500	15.38
Portland General Electric	36	8.9	8	14.5	5	14.7	1.27	1.12	2.97	23.250	16.125	-8.17
Midwest Energy	37	8.6	72	-1.4	70	-0.1	1.05	0.92	2.85	33.125	26.250	-1.56
Cleveland Electric Illuminating	38	8.4	45	3.2	67	0.3	1.27	1.37	3.53	25.625	18.250	10.75
New England Electric	39	8.2	79	-2.8	89	-4.3	1.96	1.58	3.15	25.750	18.125	-1.36
Central & South West	40	7.1	75	-2.0	76	-0.8	1.28	1.40	3.61	28.125	21.625	30.78
Wisconsin Electric Power	46	5.8	67	-0.4	60	0.7	2.80	2.68	4.75	40.500	30.750	9.72
Delmarva Power & Light	47	5.8	49	2.9	36	2.7	1.74	1.66	2.76	28.250	21.000	14.40
Wisconsin Power & Light	48	5.3	52	2.3	44	2.4	2.71	2.28	4.26	40.500	29.125	11.16
Utilicorp United	49	4.9	43	3.8	49	2.2	1.67	1.49	3.10	26.500	18.875	76.25
Union Electric	50	4.9	11	12.7	52	1.8	1.13	1.11	2.86	21.875	15.375	-0.11
Northern States Power	56	3.3	62	0.7	32	3.1	2.10	2.23	5.93	54.750	41.125	9.63
Kansas City Power & Light	57	2.9	53	2.3	57	1.0	1.31	1.42	4.41	24.500	18.000	9.36
Iowa Resources	58	2.9	38	4.7	40	2.6	1.31	1.31	4.11	37.875	28.875	-2.33
Gulf States Utilities	59	2.8	6	20.1	95	-8.2	1.29	1.35	2.10	16.500	11.625	18.24
Wisconsin Public Service	60	2.8	69	-0.9	72	-0.3	2.68	2.48	4.45	40.750	29.750	16.10
Northeast Utilities	66	-0.1	68	-0.7	58	0.9	1.67	1.66	2.72	18.750	13.750	9.95
New York State Electric & Gas	67	-0.4	17	10.0	6	13.7	1.11	1.23	3.48	29.250	21.250	11.26
Eastern Utilities Associates	68	-0.9	96	-7.7	61	0.7	0.78	0.84	2.67	26.875	16.375	-1.17
Central Illinois Light	69	-0.9	99	-9.5	84	-3.2	1.59	1.65	2.79	27.250	21.750	-0.02
Kansas Power & Light	70	-1.4	97	-8.5	100	-63.5	1.50	1.42	4.61	41.375	32.375	-3.74
Empire District Electric	76	-3.5	54	2.1	22	4.4	1.83	1.92	2.75	24.375	18.625	0.00
Ipsco	77	-3.6	50	2.6	54	1.4	1.29	1.66	3.81	40.000	31.375	5.79
Atlantic Electric	78	-3.8	33	5.5	43	2.4	1.30	1.40	3.00	29.750	23.750	14.20
Kentucky Utilities	79	-4.6	58	1.3	10	10.5	1.40	1.24	2.84	31.250	26.125	-9.97
Oklahoma Gas & Electric	80	-4.7	34	5.5	91	-5.0	1.64	1.78	2.30	27.625	21.500	0.00
Consolidated Edison	86	-9.6	90	-4.0	63	0.6	2.82	3.24	4.26	29.375	20.125	7.50
Pennsylvania Power & Light	87	-12.1	3	26.5	4	14.8	0.65	1.01	2.68	29.000	23.500	0.02
American Electric Power	88	-14.1	76	-2.1	98	-10.5	0.75	0.97	2.19	24.875	19.875	1.24
Idaho Power	89	-16.2	35	5.5	85	-3.4	1.34	1.61	2.16	24.500	18.750	-1.75
Middle South Utilities	90	-21.1	48	2.9	17	6.2	0.66	1.11	2.01	10.875	9.375	-3.15
Northern Indiana Public Service	96	-91.2	91	-4.6	88	-4.2	0.09	1.02	-0.23	12.875	8.375	14.66
Central Maine Power	97	-95.9	40	4.4	77	-0.9	0.03	1.04	0.08	14.375	9.250	-3.10
Consumers Power	98	-490.3	55	1.9	51	2.1	-0.85	0.28	-4.42	8.875	4.375	5.45
Public Service of Indiana	99	-2289.7	27	7.1	80	-1.9	-7.28	0.31	-23.17	10.125	6.875	-1.73
Centel	100	NA	59	1.3	86	-3.9	NA	NA	NA	NA	NA	NA

ALPHABETICAL LISTING OF COMPANY PERFORMANCES

Company	Electric Sales		Customers Served				Revenues			Net Income After Tax \$ (1000's)
	Rank	KWH Sales (millions)	Electric		Gas		Total \$ (1000's)	% Electric	% Gas	
			Total (1000's)	% Gain	Total (1000's)	% Gain				
Boston Edison	48	13,174	600,763	1.1	0	NA	1,203,972	94.9	0.0	94,232
Carolina Power & Light	18	32,752	852,919	3.8	0	NA	1,934,715	100.0	0.0	281,483
Centel	95	2,720	135,332	0.7	0	NA	182,417	99.3	0.0	NA
Central & South West	11	47,640	1,515,100	1.4	0	NA	2,710,751	97.9	2.1	339,760
Central Hudson Gas & Electric	79	5,001	230,567	2.3	50,698	4.3	504,802	86.5	13.5	53,488
Cincinnati Gas & Electric	43	15,785	622,532	1.3	369,460	0.5	1,396,549	67.9	32.1	143,889
Cleveland Electric Illuminating	39	17,319	718,504	0.5	0	NA	1,253,990	99.0	0.0	269,236
Commonwealth Edison	6	63,831	3,027,872	0.6	0	NA	4,964,151	100.0	0.0	839,625
Commonwealth Energy	78	5,925	314,000	6.1	208,000	1.5	678,077	61.3	36.7	40,696
Consolidated Edison	14	39,399	2,806,330	0.8	1,020,274	0.2	5,497,920	80.2	14.0	525,354
Duke Power	8	56,068	1,439,457	3.1	0	NA	2,898,911	98.6	0.0	376,681
Duquesne Light	50	12,989	561,549	0.2	0	NA	914,864	100.0	0.0	154,707
Eastern Utilities Associates	91	3,625	239,000	1.7	0	NA	333,510	100.0	0.0	29,770
El Paso Electric	84	4,278	212,901	3.4	0	NA	339,591	99.3	0.0	113,071
Empire District Electric	93	3,041	107,271	2.1	0	NA	126,986	99.6	0.0	14,191
Houston Industries	9	55,969	1,316,316	0.3	0	NA	4,061,812	87.0	0.0	464,394
Idaho Power	44	14,915	272,169	1.2	0	NA	451,180	100.0	0.0	72,376
Illinois Power	45	14,427	537,047	0.7	382,442	0.2	1,167,364	65.7	34.3	207,240
Interstate Power	90	3,782	123,950	0.0	40,494	0.4	300,612	68.2	31.8	19,289
Iowa Electric Light & Power	85	4,195	205,959	0.6	132,986	-0.1	453,262	64.3	34.2	19,056
Kansas Power & Light	58	9,176	291,317	1.5	1,146,638	4.2	1,354,128	35.5	64.5	79,002
Kentucky Utilities	54	10,918	384,600	1.7	0	NA	538,039	100.0	0.0	53,690
Long Island Lighting	46	14,016	948,797	1.4	405,330	0.7	2,033,737	82.6	17.4	440,563
Louisville Gas & Electric	63	8,033	305,979	1.3	234,752	0.4	679,508	66.6	32.8	60,001
Madison Gas & Electric	99	1,993	104,445	1.4	73,725	2.6	223,864	55.1	44.6	19,515
Nevada Power	75	6,520	235,197	4.7	0	NA	360,632	100.0	0.0	39,905
New England Electric	35	18,338	1,147,399	2.2	0	NA	1,444,279	94.9	3.4	164,078
New York State Electric & Gas	41	16,426	703,966	1.6	131,822	0.7	1,241,780	84.7	15.3	183,207
Niagara Mohawk Power	16	35,296	1,424,000	1.4	440,000	-95.1	2,694,940	77.8	22.2	351,871
Northeast Utilities	28	21,619	1,149,257	2.0	161,642	2.2	2,081,021	87.9	10.6	288,541
Otter Tail Power	92	3,396	121,862	-0.1	0	NA	175,454	100.0	0.0	20,818
Pacific Gas & Electric	5	64,728	3,760,521	2.0	3,082,935	2.1	8,430,981	69.0	31.0	866,575
Pacificorp	26	27,118	660,491	0.7	0	NA	1,983,000	56.4	0.0	219,800
Pennsylvania Power & Light	23	28,119	1,055,546	1.6	0	NA	1,976,502	99.7	0.0	199,327
Philadelphia Electric	22	26,135	1,375,854	1.3	311,706	1.8	3,013,704	83.5	14.2	434,724
Public Service of New Hampshire	73	7,070	322,656	4.3	0	NA	519,740	97.3	0.0	113,761
Public Service of New Mexico	69	7,437	255,122	4.8	315,009	NA	748,984	54.5	44.4	124,178
Puget Sound Power & Light	42	15,972	626,642	3.3	0	NA	714,108	100.0	0.0	100,963
Rochester Gas & Electric	72	7,110	307,558	1.8	241,072	1.7	743,115	63.7	36.3	108,468
San Diego Gas & Electric	53	11,658	893,868	4.7	570,770	4.3	1,738,702	80.3	19.7	178,925
Southern Indiana Gas & Electric	86	4,138	108,552	1.5	65,488	1.4	262,844	69.6	29.8	28,104
Southwestern Public Service	40	16,608	349,407	1.3	0	NA	831,806	99.7	0.0	108,688
Teco Energy	52	11,820	401,316	4.8	0	NA	886,200	96.7	0.0	98,700
Texas Utilities	3	73,370	2,015,023	5.3	0	NA	4,170,157	100.0	0.0	587,758
TNP Enterprises	74	6,616	193,907	2.2	0	NA	429,854	99.4	0.0	15,410
Utilicorp United	96	2,702	144,676	2.8	359,595	504.0	243,150	76.4	23.6	22,538
Washington Water Power	57	9,256	238,492	1.0	80,290	2.2	469,454	71.5	28.0	64,591
Wisconsin Electric Power	34	18,744	838,851	1.0	229,788	1.7	1,428,738	76.0	24.0	158,389
Wisconsin Power & Light	60	8,792	319,397	1.4	109,430	2.4	588,931	73.4	26.9	56,368
Wisconsin Public Service	68	7,445	302,070	1.0	159,821	2.0	638,504	63.2	36.8	51,896

write-offs taken by utilities with abandoned nuclear plants.

However, even without the effect of major plant write-offs, income performance was off, reflecting the higher costs of operations despite consistent efforts of managements to curtail cost increases.

As a result, the median income growth was 4.9 percent, down substantially from the median of 13.8 a year ago. Overall, income production was lower than a year ago, also.

If there is anything to boast of in the overall array of performances it is that the quality of earnings appears to be stronger than in the past, continuing the trend to reduced Al-

**TABLE III
THE TOP 10
NET INCOME AVAILABLE
FOR COMMON STOCK**

1	1 Pacific Gas & Electric	\$866.6	6.9
3	3 Southern Company	\$29.6	15.3
5	6 Texas Utilities	\$57.8	11.7
7	9 Public Service Electric & Gas	\$48.6	12.7
9	13 Long Island Lighting	\$40.6	29.5

lowances for Funds Used During Construction.

Earnings decline

Average earnings per share of common stock fell to \$2.84 in 1985, down 9.6 percent from 1984. This was based on the returns of 99 companies (Centel did not provide financial data) and included the devastating effect of write-offs of cancelled nuclear power plants.

Although a number of utilities were forced to write off investment in cancelled plants, the two hit the hardest were Public Service of Indiana, which wrote off \$1.3 billion of its Marble Hill nuclear plant in 1985, and Consumers Power, which took a \$488-million write-off on its investment in the Midland plant. If only the results of these two are removed from the earnings comparisons, the average EPS of the other 97 would increase one cent to \$3.19 from \$3.18 in 1984.

For 1985, 51 companies reported gains in earnings and 46 reported declines. A year ago, 72 companies reported gains and in 1983 the total number of gainers was 82.

Last year median growth was 0.45 percent, drastically down from the median of 6.41 percent in 1984, 9.63 percent in 1983 and 10.32 percent in 1982.

As is usual, those companies reporting the largest gains were coming off tough years in 1984. Five of this year's leaders were in the bottom ten a year ago. Only one company, Potomac Electric Power, is a repeater in the top 25 companies in 1985, although it dropped from 10th to 13th.

The majority of the companies at the bottom of the EPS-growth list suffered nuclear plant write-offs in 1985. Unfortunately, most also are repeaters from the bottom of the EPS-growth list from 1983 and several have been at or near the bottom for one or more previous years.

Fire risk high for T-G units, survey results show

CHICAGO—Results of a recent survey show that the fire risk to a turbine generator is one fire per 185 unit-years of operation, with the average fire causing about \$850,000 in property damage and approximately 39 days of unit downtime.

Conducted for the Electric Power Research Institute by Black & Veatch, Engineers-Architects, the survey found that there were no instances of significant fire damage or outages where a properly engineered fire protection system was installed.

Black & Veatch received 151 responses from 210 utilities surveyed. The questions regarded steam turbine generator fires and explosions within the utility industry from 1930 to 1983.

David T. Hall and Thomas C. Clayton reported the results of the study at the recent American Power Conference. Westinghouse Electric

Corp. and General Electric Co. participated as subcontractors in the report.

According to the authors, the survey was undertaken because statistics indicate that the fire risk for a large turbine generator set is unacceptably high.

Most common cause

The authors found that there were 175 fires and 33 explosions in the period surveyed. According to the study, the most common cause of fire was oil (see table) and the most likely location was in the bearings (39 fires). In addition, fires were reported in the piping (16), valves (14), below the operating floor (14), and in the turbine reservoir and tanks (7).

The survey findings show that manually activated water spray systems were the most common type of fire suppression used by utilities for tur-

bine and generator bearings. Carbon dioxide systems were used most on the turbine governor housing of nuclear units and carbon dioxide and water systems were split evenly on coal-fired systems.

Heat detection was the most popular means of fire detection for all turbine generator areas.

Said the authors, "The major concerns of the turbine generator manufacturers regarding water-based fire suppression involve possible adverse effects on the turbine generator and associated equipment in the event of water spray when a fire does not exist."

Water damage minimal

In the majority of cases reported by the utilities, water was applied because of a fire. The survey found that in almost all of the cases, water damage to the turbine was less than \$300.

No downtime was reported because of water being applied.

Analysis showed

An analysis of the survey results showed that oil is the greatest fire hazard associated with the turbine generator and its auxiliary equipment.

"Forty-five of the fifty-five significant fires, defined as causing one day or more in unit outage or \$100,000 (1983 dollars) property damage, involved oil," reported the Black & Veatch engineers.

SUMMARY OF FIRE OCCURRENCE/EXPLOSIONS BY TYPE

Type	Fires/Explosions
Oil ^a	91
Hydraulic oil ^b	16
Hydrogen explosion and oil fire	3
Hydrogen ^c	15
Hydrogen and oil	9
Hydrogen explosion ^d	33
Electrical	18
Class A ^e	9
Hydrogen fire and explosion	1
Paint	1
Undetermined	12
Total	208

^aIncludes listing of oil and lube oil. A number of these are thought to have been units where lube oil was used as hydraulic oil.

^bTwo of these fires involved fire-resistant hydraulic fluid. The fires were of the smoldering type in insulation with minor or negligible damage.

^cIncludes only hydrogen fires with no concurrent oil fire or explosion.

^dIncludes only hydrogen explosions with no concurrent fire.

^eClass A fires are cable insulation, paper, wood, etc., as defined by the NFPA.

Source: "Turbine Generator Fire Protection Overview," Hall & Clayton, Black & Veatch Engineers-Architects, April 1986

COSTLY FLY-ASH EROSION



in the Pennsylvania Power & Light Co.
750 mw coal-fired No. 3 boiler
economizer at Brunner Island
required that the original unit be replaced.

A RESEARCHED AND EVALUATED DECISION WAS MADE IN FAVOR OF SENIOR GREEN ECONOMIZERS

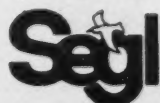
In a change from a close pitch, staggered tube arrangement—PP&L's specification stated that "replacement elements may have welded fins or be bare tube", and more specifically "the elements of both banks shall be of an in-line arrangement; that is, uniform, vertical, open lanes shall be established between successive elements. These open lanes shall be unobstructed over the entire depth of the elements."

SENIOR GREEN ECONOMIZERS met these specifications, offered the specified performance

within the dimensions of the existing economizer chamber—and at an inlet gas velocity of 50 fps as compared with the original 76 fps.

In its research, PP&L learned that there are over 240 coal-fired utility boilers throughout the world which have Senior Green Economizers installed.

If you have velocity-induced fly-ash erosion problems, or if you need to increase your present economizer performance, call SENIOR GREEN. We could have the answer!



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Inquire R.S. 8

The survey recommends that a fixed fire protection system should be provided for the turbine generator bearings, lube oil piping under the turbine generator lagging, the exciter, areas below the turbine floor, the lube oil reservoir, and the boiler feed pump turbines.

Black & Veatch determined that the best method of fire suppression for oil fires is water, while the most effective method for exciter fires was found to be carbon dioxide.

The authors presented several features that they recommended be included in a fire protection system for nuclear and fossil fueled units.

Recommendations

They recommend use of:

1. An automatic water spray with closed head nozzles for the turbine generator bearings.
2. An automatic wet pipe sprinkler system (nonfreezing conditions) under the turbine generator lagging.
3. A manual carbon dioxide system for the exciter.
4. An automatic wet pipe sprinkler system (nonfreezing conditions) under the operating floor.
5. An automatic water spray with open heads for the lube oil reservoir.
6. An automatic water spray with closed head nozzles for the boiler feed pump turbine bearings and steam generator feedwater pump turbine bearings.

The system designed for the study was engineered for a 600 to 700 MW fossil fueled unit.

Additional fire risk

Black & Veatch conducted a risk-benefit analysis and found that the additional fire risk in 1983 dollars for 30 years of operation without a fire protection system is \$1,620,000 for a 600 MW coal unit and \$870,000 for a 900 MW nuclear unit.

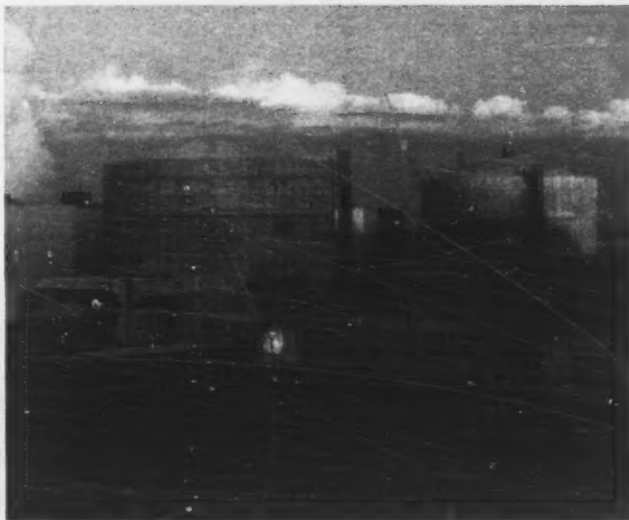
Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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NRC licenses Catawba-2

Duke Power's 1,145 MW Catawba Nuclear Station Unit 2 (r.) was issued a full power operating license by the Nuclear Regulatory Commission in May. The \$3.7 billion two unit station is jointly owned by Duke Power, the North Carolina Municipal Power Agency No. 1, North Carolina Electric Membership Corp., Saluda River Membership Corp., and the Piedmont Municipal Agency. Construction began on the station in 1974, Catawba-1 generated its first electricity in January 1985. The plant is located in South Carolina on the shore of Lake Wylie about 17 miles southwest of Charlotte, North Carolina.

Senate's tax reform measure gains support of EEI Board

SAN FRANCISCO—The Edison Electric Institute's Board of Directors voted at its annual meeting last month to support passage of the Senate Finance Committee's tax reform bill.

The board said that it is important for the Senate to pass the committee bill in order for meaningful tax reform legislation to be enacted in 1986.

EEI said it was concerned with provisions of the bill affecting long-range capital formation needs. The board agreed that, despite cash flow difficulties it will pose for many utilities, the industry should support Senate passage of the bill.

The board also agreed to join the "15/27/33" coalition, which is committed to oppose any amendments that increase the top tax rates, add any new taxes, or in any way diminishes tax relief provided to low income individuals and families.

Will seek changes

When the bill gets to joint committee, the board indicated it will seek further improvements, especially in the proposed alternative minimum tax provisions.

The congressional Joint Committee on Taxation noted in a summary of the bill that it "...is estimated to be revenue neutral; over the next five years, the tax burden of individuals would be reduced by approximately \$100 billion, while corporate taxes would increase by a similar amount."

According to the summary, the top corporate income tax rate would be cut from 46 to 33 percent. The investment tax credit would be repealed,

but the present-law Accelerated Cost Recovery System would generally be enhanced for equipment to provide more generous depreciation benefits.

Also, the alternative minimum tax for corporations would be instituted, which the bill's creators say will prevent profitable corporations from avoiding any significant current tax liability.

Bill provisions

Among some of the Senate bill's provisions:

- Utility property with an ADR mid-point life of 20 years or more; and steam and electric generators or distribution systems would be depreciated over 15 years using a 150 percent declining balance.
- The investment tax credit would be repealed effective January 1, 1986. Credit carryforwards and credits earned on transition property would be reduced by 30 percent.
- Finance lease rules would be repealed, effective January 1, 1987.
- Utilities using the accrual method of accounting would have to include earned but unbilled income in gross income.
- The 85 percent limitation on the amount of income tax liability that can be offset by business tax credits would be reduced to 75 percent.
- Business energy tax credits would be extended for solar, geothermal and ocean thermal energy through 1988, and for wind energy and biomass through 1987, at reduced rates. The residential energy credits would expire (after 1985) as under present

Continued on page 26

Summer peak demand will rise; capacity adequate, NERC says

PRINCETON, NJ—U.S. electric utilities predict a 4.9 percent increase in summer peak demand over last year, according to a report by the North American Electric Reliability Council (NERC).

In Canada, utilities are forecasting a 4.6 percent increase.

Only one NERC region, the Mid-Atlantic Area Council, is forecasting a decrease in 1986 summer peak demand (-1.0%). The Mid-continent Area Power Pool, which covers the North Central portion of the U.S., forecasts the highest increase in summer peak (11.0%).

NERC says that generating capacity margins will be adequate to meet the demands in all areas except Long Island. The report points out that the delay in the commercial operation of Long Island Lighting Company's Shoreham nuclear plant coupled with insufficient transmission capacity to Long Island could result in power supply problems this summer.

Another problem area pointed out by the report is in the Tennessee Valley, where TVA has five nuclear units out of service. NERC said continued drought and extremely hot weather in the valley could cause "critical operating conditions."

Regarding electricity transmission, NERC stated in its report, "The recent dramatic decrease in the price of oil has reduced the amount of economy energy being transferred over the bulk electric supply networks. These transfers are still high in some areas, which reduces the ability of utilities to respond to system disturbances."

NERC believes an oil price increase will likely increase energy transfers and load transmission networks to their maximum allowable levels more hours of the day.

"Delays in building additional transmission lines continue to re-

strict electric energy transfers in North America and jeopardize system reliability," warned the report.

NERC reports that transmission restrictions still exist in Montana, Colorado, Ontario, Michigan and the Wisconsin-Minnesota area.

A delay in the construction of the Belle River-Jewel No. 2 345-kV line in Michigan leaves the system open to instability, low voltage in Michigan and Ontario and possible intersystem cascading outages, found NERC.

Also, NERC said the Rocky Mountain Power Area is plagued with transmission limitations that severely limit surplus energy deliveries to the Southwest to displace oil and gas-fired generation.

"Parallel path flows (loop flows) may also cause curtailments of economy, surplus and even firm energy schedules from Colorado, New Mexico and Arizona to Southern California and from the Pacific Northwest to California."

Two coal-fired plants and one nuclear unit are expected to come on-line this summer. NERC said Basin Electric Power's Antelope Valley-2 (450 MW) unit and Intermountain Power Agency's Intermountain-1 (761 MW) should begin service this summer. Also, Gulf States Utilities' River Bend-1 (940 MW) nuclear unit will begin operating.

For more information on NERC's 1986 Summer Assessment, call the council at (609) 924-6050.

**Look for 1985's
Top 100 Operating
Performance story
in the August EL&P**

Utility productivity declined in last 13 years, reports NARUC

WASHINGTON—Only one of 112 electric utilities experienced a positive improvement in productivity between 1972 and 1984, according to a new report from the National Association of Regulatory Utility Commissioners (NARUC).

Using a technique known as Total Factor Productivity (TFP), NARUC said Central Power & Light Company demonstrated the highest productivity improvement over the thirteen years. Ranked from second to fifth were West Texas Utilities Co., Union Electric Co., Southwestern Electric Power Co. and Long Island Lighting Company.

NARUC's *Electric Utility Performance Study* has been updated and now includes 1984 data. The report compares financial performance, electricity price trends and operating

performance of 112 major investor-owned electric utilities.

The association began publishing the studies in 1984 to develop a means by which regulators and others could compare the performance of electric companies over time.

NARUC Director of Financial Analysis Mike Foley told *EL&P* that the most important finding of the newest study is that "technological changes in the industry have not kept pace with the cost increases companies have had to absorb and pass on to customers."

More expensive

He said the report clearly shows that the economies of generating electricity substantially changed in the early 1970s, making it more and more

Continued on page 3

Solarex installs photovoltaics for PECO

● Solarex Corp. said it will install a 3.6 kW array of amorphous photovoltaic modules this summer at Philadelphia Electric Company's (PECO) Limerick-Pottstown Airport. PECO is undertaking the research and development project to gain experience with the equipment. "Utilities participating in this type of research effort, will be in a position to provide valuable service to customers as this technology becomes economically viable," said John Goldsmith, vice president of technology programs at Solarex. The amorphous solar cells, according to Solarex, will provide a substantial cost reduction over the crystalline solar cells currently being used.

ANPP offers \$25,000 reward for line sabotage information

● The Arizona Nuclear Power Project (ANPP) is offering a \$25,000 reward for information leading to the arrest and conviction of the person or persons responsible for the May 14 sabotage of three major high-voltage lines. The lines are tied to the Palo Verde nuclear generating station, 55 miles west of Phoenix. The FBI has determined that several individuals caused three of the four 500,000-volt lines to trip. Within a 25-minute period, beginning at approximately 9 p.m., the three lines experienced separate faults at points 25 to 35 miles from the plant, according to ANPP. Any information concerning the incident should be reported to the FBI at (602) 279-5511.

NY hydropower plant named after Challenger Astronaut Jarvis

A New York Power Authority hydro-power plant in the Mohawk Valley, has been named after Astronaut Gregory B. Jarvis (right) who died aboard the Challenger space shuttle in January. "Gregory Jarvis dedicated his life to science and excellence," said Power Authority Chairman Richard M. Flynn, "His accomplishments are an inspiration to the citizens of the Mohawk Valley and the entire state and nation. The Power Authority is proud to help honor his memory." Jarvis graduated with degrees in electrical engineering from the State University of New York at Buffalo in 1967 and from Northeastern University in Boston in 1969. The 9,000-kW, \$23 million plant is in the final stages of testing, according to the New York Power Authority, and is eventually expected to produce more than 32 million-kWh of electricity annually.



Minnesota Power splits common stock two-for-one

● Minnesota Power said a two-for-one split of its common stock went into effect June 20. At the company's annual meeting in May, shareholders approved an increase in the authorized number of common shares from 25 million to 65 million. "We believe a two-for-one split will make our stock more appealing to investors across-the-board," stated Minnesota Power Chairman Jack F. Rowe.

In This Issue

Editorial	4
New "Employee-Tailored" Benefits Plans are attractive to both employees and employers in the public utilities industry.	6
Leaning stack liners pose new problems.G	8
Calendar	11
Tests show cooling tower blowdown water needs can be cut substantially by pretreatment and reverse osmosis or electrodialysis.G	13
Hurricane Gloria taught painful lessons to three utilities.T/D	14
Joint use of transmission towers for hybrid HVDC and HVAC use is feasible, based on investigations carried out by Ontario Hydro.T/D	18
New Products	20
Readers' Service	21
New Literature	25
Personnel	27
Regulatory Review	29
Management Methods	30

ELAP readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive ELAP's industry news section.

EIA, NEMA launch Power Sources Industry Council

● The Electronic Industries Association (EIA) and the National Electrical Manufacturers Association (NEMA) have jointly launched the Power Sources Industry Council. The council will be divided into functional areas such as marketing, education, information, user liaison and government relations. Its goals and objectives include providing a national voice in government and industry affairs for companies manufacturing components and devices covered by the council's scope; promotion of the exchange of ideas and information between member firms; development and distribution marketing, business information and the establishment of a mechanism by which standards can be developed. The product scope of the council includes linear, switching, AC/DC, DC/AC and DC/DC power supplies, miniature and modular power supplies, power line conditioners, power line filters, batteries, battery chargers and solar cells, UPS/uninterruptible power supplies, test equipment for power supplies and fuses. The council will be operated by an elected board of directors consisting of six members each from EIA and NEMA.

Washington Public Power approves litigation settlements

● Washington Public Power Supply System's executive board approved a total of \$18,391,837 in litigation settlements with three major electrical contractors, Fischbach & Moore Inc., Wismer & Becker Contracting Engineers Inc. and Lord Electric Co. Settlements totaling \$22,403,592 have now been reached with five of six electrical contractors named in an August 1983 lawsuit filed in Seattle's U.S. District Court. The suit alleges the defendants had engaged in a national conspiracy to rig competitive bids on electrical contracts, including those for Supply System construction projects. Settlements were reached last year with Commonwealth Electric Co. and in February with Howard P. Foley Co. Litigation continues against L.K. Comstock & Co.

Consumers Power investigates equipment failures

● Consumers Power Co. is investigating equipment failures associated with the May 19 unplanned automatic shutdown of its 761 MW Palisades nuclear plant. The shutdown occurred when electrical power to the hydraulic control valves for the unit's turbine-generator was lost. After the Nuclear Regulatory Commission (NRC) expressed its concern about the link between the unplanned shutdown and the equipment failures, Consumers Power agreed to a recommendation by NRC officials that the plant be temporarily kept out of service pending an investigation and resolution. The company will conduct its own investigation of the unit's condition to ensure continued safe and reliable operation, according to Jack Reynolds, Consumers Power executive vice president for energy supply.

KCP&L plans central steam heating system conversion

● Kansas City Power & Light Co. (KCP&L) submitted a plan to the Missouri Public Service Commission for converting the utility's central steam heating system to on-site electric steam boilers or other electric heating equipment. KCP&L officials said the system, which has served commercial buildings in the downtown district since before 1900, now operates at a substantial loss because of rising costs, inadequate rates and a declining number of customers. According to KCP&L's plan, the system will be phased out by 1990 and the company will handle all equipment and installation expenses.

NLC opposes sale of federal power marketing administrations

● A committee of the National League of Cities (NLC) has adopted a resolution opposing the Reagan Administration's proposal to sell the five federal power marketing administrations (PMAs). According to the resolution, the sale of the federal water resources to private interests would "jeopardize the economic vitality of certain cities, states and regions of the country by forcing up electric costs for consumers." The American Public Power Association estimates that the sale of the PMAs would result in rate increases of up to 390 percent. The NLC board of directors will consider the resolution when it meets this month.

NARUC releases report on EEI's 1985 expenditures

● The National Association of Regulatory Utility Commissioners (NARUC) released its 1985 *Report of the Committee on EEI Oversight*. This second annual report on the Edison Electric Institute's 1985 financial operations differs from last year's report in two respects. The 1985 report covers a twelve-month period as opposed to last year's three-month trial period coverage. Also, this year's report includes a schedule of all honoraria and expense reimbursements paid to government officials by EEI. An independent auditor's report of financial statements and supplementary information is contained in the report, as well as an organizational chart, IRS Form 990, a list of the major Federal and State legislation on which EEI personnel spent time researching, and the EEI definition of accounts used for NARUC reporting requirements. Copies of NARUC's report are available for \$20.00 from NARUC, P.O. Box 684, Washington, D.C. 20044.

GPU companies to spend \$40 million to protect environment

● General Public Utilities Corp. (GPU) said that three of its operating companies have allocated almost \$40 million this year on projects to protect the environment. Pennsylvania Electric Co. will invest \$22 million, Metropolitan Edison is expected to spend almost \$10 million and Jersey Central Power & Light has allocated more than \$7.5 million on environmental facilities, according to GPU. "We recognize our responsibility to minimize the impact of our operations on the environment," stated GPU President Herman Dieckamp.

Chernobyl: The big problem...

The future of nuclear power in the U.S. was dimmed again by the dark cloud (no pun intended) of Chernobyl. Thanks to the national news media...primarily television, the American public was re-educated in the Russian-roulette nature of nuclear power. Despite having been shown to have created a near national panic by its imaginative reportage of the Three Mile Island excursion in 1979, network TV again exercised its creative capabilities to build the Russian accident into a near-Armageddon, aided and abetted by local station efforts to grab some of the spotlight. Combined they proved once again that in the TV news business, as in other parts of show-biz, nothing (like facts or the lack thereof) should ever be allowed to detract from the desired impact on the audience.

Russian restrictions of information about the accident merely made it easier for TV news directors to treat the event creatively...leading to a variety of interpretations of what might have happened there, often followed by anti-nuclear descriptions of how complex nuclear technology is and why we in the U.S. are destined to suffer even more disastrous nuclear catastrophes in the future.

The frequency with which the general news media look for explanations or clarifications of technical issues to the self-styled "experts" from organizations like Ralph Nader's Critical Mass organization or the Union of Concerned Scientists is a source of constant wonder. Of course, since these "experts" are not limited by fact, their presentations can be as dramatic as they desire and that makes for a strong show-business finish, a real zapper, in strong contrast to most pro-utility presentations. Moreover, the anti-nuclear front seems to make its people available whenever and wherever it can, while pro-nuclear forces seem to hang back, waiting for invitations.

If executives of nuclear utilities want to assess how well they've done their community and media relations jobs, TV coverage of the Chernobyl excursion should provide a score card. The mass of misinformation and scaremongering that followed in the days immediately following the report of the accident should make it clear that the industry hasn't done a very good job of educating the media or convincing them of the industry's credibility and sincerity.

... and the small one: PURPA

It's heartening to note the interest of Congress in re-evaluating PURPA and its effect on energy suppliers and users. PURPA, through its cogeneration clauses, has provided slick entrepreneurs with licenses to steal in many areas. While the immediate victim may appear to have been the local utility, the ultimate victim is the one who always must pay the bill...the consumer.

Both the House and Senate are reviewing PURPA legislation, questioning whether the forced purchase by a utility of electricity from a cogenerator is always good for the consumer. Among other issues, they are evaluating whether or not cogenerators may not have become unregulated utilities, given the opportunity to earn an unregulated return on the guaranteed sale of energy at an officially directed rate.

While there are a number of well-engineered, integrated heat/electricity systems in industry throughout the U.S., there also are many cogenerators in the game only to make a quick buck, who only nod at the concept of service.

The fundamental purposes of PURPA unfortunately have gotten lost in the rush to guarantee cogenerators their "rights." Hopefully, Congress will see these weaknesses and correct them.

Corrections to June Top 100 Electric Utilities report

The following is published to correct errors made in 1984 data input for the Top 100 Electric Utilities report, published in the June issue of *EL&P*:

Cincinnati Gas & Electric's 1984 per share earnings should have been recorded as \$2.45, not \$1.45 as listed in the earnings growth table (p. 17). This would reduce its 1985 growth to 34.7 percent, which would have moved it down one position, to 4th, behind Utah Power & Light.

On the Sales Data table (p.18), Potomac Electric Power achieved a 4.2 percent increase in kWh sales in 1985, good for 24th ranking among the Top 100 electric utilities, not 2nd as initially calculated. As a result, companies originally ranked 3 through 13 all move up one rank. Kansas Power & Light now should be ranked 13th now on the strength of its 7.1 percent gain in kWh sales in 1985. Companies ranked 24 through 99 on the published table now should all move down one rank.

Need for nuclear education

You are quite right in describing our national indulgence in the nuclear debate as a luxury brought us by our abundance of natural resources, and in stressing that our utilities must support nuclear suppliers now if we expect to have a nuclear industry in our future. (See March Editorial, p.4) I would like to add a note about another crucial element in the equation that also needs immediate support.

I quote from "The Revitalization of Nuclear Energy Education in the United States," a study completed in October 1985 by the Nuclear Engineering Department Heads Organization: "The current decline of nuclear energy education in the United States threatens the ability of the country to supply nuclear energy professionals. Without such professionals, the nuclear industry will eventually find it impractical or impossible to maintain the option of using nuclear energy for power generation."

The report documents a number of disturbing trends: declining numbers

of degrees in nuclear engineering, reduced federal funding of university research and fellowships, obsolete laboratory equipment and research reactor facilities. Nuclear professionals will be needed in this country not only to maintain the nation's existing fleet of nuclear power plants throughout their lifetimes, but also to implement the changes that will be necessary to revive the nuclear option in this country—design standardization, efficiency improvements and rational approaches to licensing and regulation.

Like the industrial infrastructure you discussed, the nation's nuclear energy education program did not just happen. It took over 30 years of building and refining to make it the world's best. If we allow it to erode through the lack of interest, we may not have available the most important resource needed to retain the nuclear power option, which is fast becoming the option of choice for industrialized nations around the world.

Gerald J. Brown, Professor
University of Lowell, Lowell, MA.

EEI's Edison Medal goes to Florida Power & Light Co.

SAN FRANCISCO—The Edison Electric Institute has presented its highest award, the Edison Medal, to Florida Power & Light Co.

The award honors the utility for its Quality Improvement Program, an internationally recognized program that has led to "significant savings, marked increases in customer satisfaction, reduction in production and delivery costs and improved communication and cooperation among employees."

Employee participation

Instrumental to the program's success has been a high level of employee participation. FP&L quality teams have submitted more than 1700 suggestions to improve the quality of service to customers since the program began in 1982.

In addition, more than 400 organizations in the U.S. and Europe, including 24 electric utilities, have attended special seminars about the program and how to implement similar efforts.

Recognition of commitment

John J. Hudiburg, FP&L chairman of the board, said the award "means more to us than any other we have ever received because it is recognition of our commitment to customer

service by our own industry." Declaring that winning is often a matter of teamwork, and that more than 8,000 of the company's employees are actively involved on quality teams, he said "nowhere can the cooperative spirit of service be more evident."

The Edison Medal is presented annually at EEI's convention in recognition of conscientious service and progressive development by investor-owned electric utilities.



FP&L Chairman John J. Hudiburg (l) receives the prestigious Edison Award from Sherwood H. Smith, president of the Edison Electric Institute, at EEI's 54th Annual Convention in San Francisco last month. The award, EEI's highest recognition, was presented to FP&L for its internationally recognized quality improvement program.

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Technical Publishing

a company of
The Dun & Bradstreet Corporation
Barrington, IL 60010 • (312) 381-1840

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Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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AZP Group buys Arizona's largest savings bank for \$440M

PHOENIX—AZP Group, Inc., the holding company for Arizona Public Service Co., announced in June its intention to purchase the state's largest savings bank for approximately \$440 million.

Keith Turley, AZP Group chairman and chief executive officer, said in a statement that his company would acquire MeraBank's 8.7 million shares for \$51 per share.

Will become subsidiary

Under the agreement, MeraBank would become a wholly-owned subsidiary of AZP. The bank would retain its current management group. The companies said the acquisition is subject to the approval of the bank shareholders and the Federal Home Loan Bank Board, and should be finalized in late 1986 or early next year.

AZP Director of Corporate Planning Arlyn Larson told *EL&P*, "The opportunity to acquire came to us. We weren't out searching for a savings bank." He added, "We know these people. They have relatively the same customer territory as APS (Arizona Public Service)."

Special provisions

Larson stressed that the bank will have no relation to AZP's utility subsidiary. He said the agreement contains special provisions that state no utility money can be involved in purchasing the bank.

In addition to the utility, AZP is the holding company for SunCor Development Co. (real estate), Malapai

Resources Co. (uranium) and El Dorado Investment Co. (venture capital). AZP Group has assets of \$5.5 billion.

"AZP views this acquisition as an important step in our diversification strategy," noted Turley. "MeraBank is a sound, well-managed financial institution with an excellent growth record and future potential."

Larson explained that AZP's criteria for any new subsidiary is that it must be able to contribute 10 percent of consolidated earnings within a few years of being bought.

Excellent prospects

"Our judgement indicates that MeraBank is extremely strong," said Larson. "They have excellent prospects for growth."

MeraBank, which is based in Phoenix, is Arizona's third largest financial institution with assets of \$5.2 billion. It has 69 branches in Arizona and six in Texas. In addition, it provides financial services in California, Colorado, Nevada, New Mexico, Oklahoma and Utah.

Gene Rice, chairman and chief executive officer of the bank, said, "The directors and managers are pleased to recommend this offer to our stockholders. AZP will be a great owner. We have common interests and the financial strength of the combined companies can only improve our growth and earnings potential."

If the deal closes after Dec. 8, AZP said the purchase price will be subject to an upward adjustment.

Test center will be cornerstone of U.S. pollution control efforts

BARKER, NY—The world's most advanced facility for developing and testing advanced pollution control technologies on eastern, high sulfur coal should be operating in December, according to the Electric Power Research Institute.

At a press briefing in June, EPRI Senior Vice President Richard Balzhiser said the \$65 million High Sulfur Test Center (HSTC) here will be the cornerstone of a research effort by U.S. electric utilities to develop and improve air pollution control systems on fossil-fired power plants.

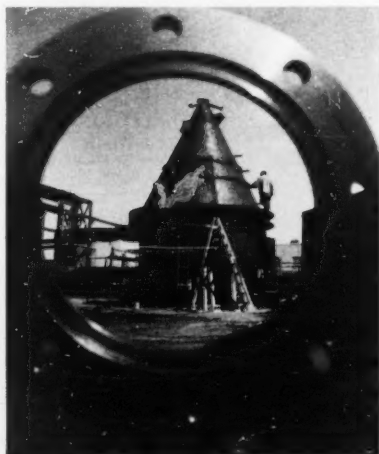
"Reducing the cost of keeping America's air and lakes clean is one of the major goals of the High Sulfur Test Center," he stated.

Research goals for the center include reducing the complexity and cost of present air pollution control systems and developing more effective methods of controlling pollutants caused by burning high sulfur coal.

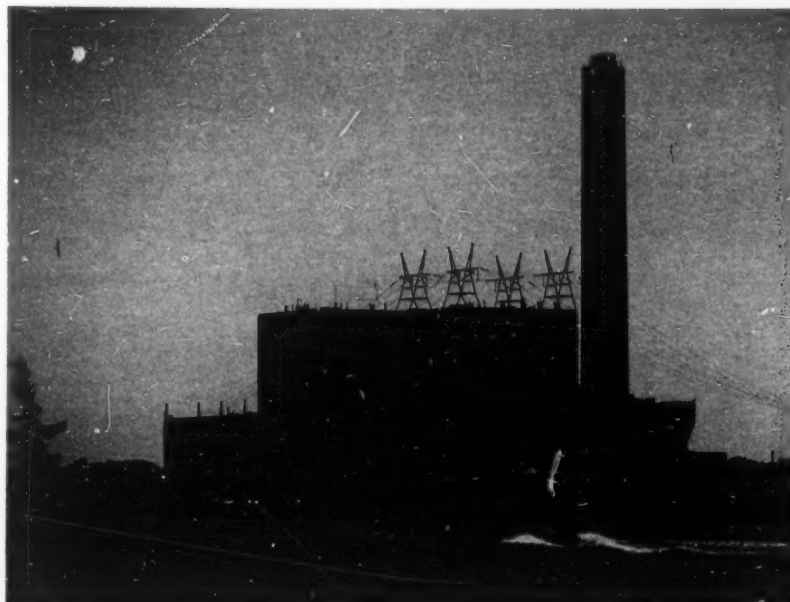
Located at New York State Electric & Gas Corporation's Somerset station near Buffalo, the HSTC consists of two buildings on 17,000 sq ft. It contains laboratories and a 92-ft high structure for flue gas experiments.

Balzhiser told reporters and state and local government officials that EPRI's research shows that a 3-4 percent improvement in the reliability of air pollution control systems can save several million dollars yearly in operation.

Continued on page 12



A workman inspects the spray dryer at the High Sulfur Test Center, under construction at the Somerset Power plant near Buffalo.



Comm. Energy heads Top 100

Commonwealth Energy had the best heat rate in the nation in 1985, according to *EL&P*'s annual Top 100 operating report. Canal 1, shown here, is the company's most efficient generating unit. For a more detailed look at the Top 100 investor-owned electric utilities, turn to the story that begins on p.17.

Competitive bidding urged for some utility contracts by GSA

WASHINGTON, D.C.—If a recent proposal of the General Services Administration (GSA) is adopted, government facilities would be required to put up their electricity service for competitive bid.

The proposal will face strong opposition from the electric utility industry and several members of congress. The change first came to light in a May 7, 1986 proposed rule in the Federal Register. GSA also would be required to competitively obtain gas, water, sewage and steam services.

Proposed by the GSA, the Department of Defense, and the National Aeronautics and Space Administration, changes would be made to the Federal Acquisition Regulations (FAR) governing utility services procurement.

GSA said the proposal came as a result of the Competition in Contracting Act of 1984, which says federal agencies must procure all goods and services competitively.

According to the Edison Electric Institute, local utility customers would be most adversely affected by the proposal. EEI said if federal customers are lost, utilities will have to increase rates to its remaining consumers to pay for the capacity it had built to serve the government facilities.

Also, EEI said that if federal customers are allowed to shop for their service it will complicate the task of future supply planning. The result, said the association, could be gaps in supply adequacy and reliability and uncertain electric rates.

EEI asked for and received an ex-

tension to the comment period for the proposal. The GSA has set a Sept. 5 deadline for comment on the proposal. The utility trade group will be asking that the FAR proposal be dropped.

In a June 17 letter to GSA Administrator Terence C. Golden, House Appropriations Committee Chairman Jamie L. Whitten (D.MS.), and members of the committee.

Continued on page 11

Mid-year financings by electric utilities 124% more than '85

NEW YORK—Total financing by investor-owned electric utilities in the first half of 1986 amounted to \$13.0 billion, 124 percent higher than in the same period last year, said Ebasco Business Consulting Company.

In its *Analysis of Public Utility Financing*, Ebasco said long-term debts issued by electric utilities in the first six months rose from \$4.4 billion in 1985 to \$11.6 billion.

Preferred stock financings by electric utilities totalled \$803 million in 1986, compared to last year's \$295 million during the same period.

Common stock offerings plunged from \$1.1 billion in the first half of 1985 to this year's total of \$517 million.

Total financing by all types of investor-owned utilities amounted to \$20.8 billion for the six months, 170 percent higher than 1985's total of \$7.7 billion.

Five utilities receive APPA energy innovator awards

● The American Public Power Association presented five utilities with energy innovator awards at its national conference in Toronto. Receiving awards were Anaheim (CA) Public Utilities Department, Eugene (OR) Water and Electric Board, Grant County (WA) Public Utility District, Palo Alto (CA) Municipal Utility and Memphis (TN) Light, Gas and Water Division. The utilities were cited for outstanding advances in the development or application of highly creative energy-efficient techniques or technologies.

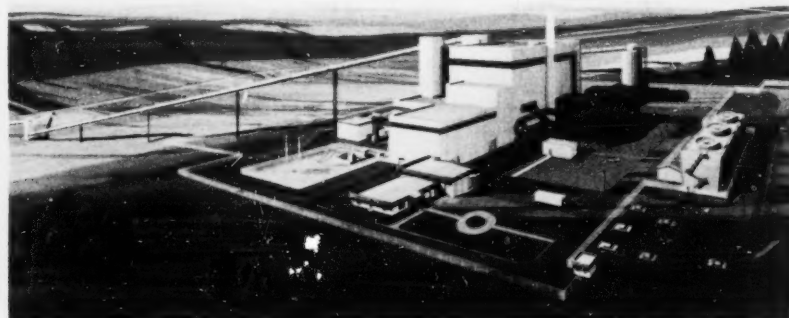
LADWP to end 50-year operation of Hoover Dam Power Plant

● The Los Angeles Board of Water and Power Commissioners said that on June 1, 1987, the United States Bureau of Reclamation will take control of the 13 generating units at the Hoover Dam Power Plant. The Los Angeles Department of Water and Power has operated the units since 1935. The bureau will also control the four units currently operated by Southern California Edison Co., according to the Commissioners.

PSC delays decision on Midland nuclear plant conversion

● The Michigan Public Service Commission said it will delay its decision until the fall, on whether Consumers Power Co. can spend funds to convert the idled Midland nuclear plant into a combined-cycle natural gas plant. Consumers Power Chairman and CEO William T. McCormick, Jr. said, "The company remains convinced that Michigan will need the power that Midland can provide...."

Ground broken for new fluid bed cogeneration plant in PA



An artist's rendering of the \$130 million John B. Rich Memorial power station in Gilberton, PA. Construction on the circulating fluidized bed boiler for the 80 MW cogeneration plant is expected to begin in October. Using Pyropower Corporation's Ahlstrom Pyroflow technology, the station will be fueled by anthracite culm. Electricity from the plant will be sold to Pennsylvania Power & Light and steam will be used in an adjacent industrial park. Owned by Gilberton Power Co., the station is a joint venture of Pyropower, Bechtel Development Co., and Ri-Corp. Development Company. Pyropower said the station will be completed in Feb. 1988.

In This Issue

Editorial	4
Calendar	9
Operating performance at the 100 largest investor-owned utilities is reported for the year 1985.	17
RG&E saves time and money by automating drafting steps in the reproduction of engineering maps and drawings.T/D	34
A new kind of insulator coating provides easy installation and long-life protection against arc-tracking and flashovers.T/D	37
Utility Telecommunications Council exhibitor's literature.	38
New Products	41
Readers' Service	43
New Literature	45
Personnel	48
Regulatory Review	49
Management Methods	50

EL&P readers whose responsibilities include both Generation and Transmission Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

Presidential citations awarded to eleven utilities

● President Reagan cited 11 investor-owned utilities for their outstanding private sector initiatives. Citations were given to Baltimore Gas and Electric Co., Cleveland Electric Illuminating Co., Commonwealth Edison Co., Consumers Power Co., Dayton Power & Light Co., Delmarva Power & Light Co., Duke Power Co., Hawaiian Electric Co., New Orleans Public Service Co., Puget Sound Power & Light Co., and Virginia Power. Reagan commended the recipients for their "organizational expertise and knowledge on the marketplace to focus on new opportunities to promote community partnerships."

Westinghouse wins Singapore energy management contract

● The Public Utilities Board of Singapore has awarded a \$10.6 million contract to Westinghouse Electric Corp. to supply a computer-based system for managing and controlling Singapore's electrical energy generation and transmission operations. According to Westinghouse, the system will provide economical generation and delivery of power, as well as automatic real-time assessment of power system security.

Sen. Byrd given first Outstanding Coal Legislator Award

● The National Coal Association (NCA) honored Senator Robert C. Byrd (D.WV) with its first Outstanding Coal Legislator Award. In presenting the award NCA Chairman Richard Holsten said Byrd was chosen for his "leadership in making clean coal technology a reality. His contributions," Holsten continued, "have been wide ranging and his service to the industry has been broad and deep."

GPU says largest drill sample yet, obtained from TMI-2 core

● GPU Nuclear Corp. said a six ft long drill sample of stratified core debris was obtained from the reactor at Three Mile Island Unit 2. The sample, according to GPU Nuclear, is the largest extracted so far, and will be analyzed at the U.S. Department of Energy's Idaho National Engineering Laboratory over the next several months. GPU Nuclear analysts are currently reviewing video tapes and other data from the drilling program to plan for removal of the remaining core material.

Public Service of NM denied holding company application

● At press time, Public Service of New Mexico (PNM) announced that it had been denied an application to form a holding company by the New Mexico Public Service Commission. PNM Senior Vice President and Secretary J.B. Mulcock, Jr. said that the decision was "extremely disappointing," but that PNM would not have any further comment until the commission had issued its order and the company had a chance to review it.

AIF urges vacationers to visit a nuclear power plant

● The Atomic Industrial Forum (AIF) is suggesting that Americans vacationing in the U.S. this year take an "energy break" during their trip to visit a nuclear power plant. AIF says that there are over 90 energy information/visitor centers in the U.S. and Canada that provide guided tours of plants, movies, slide shows, demonstrations, video programs and lectures. "One of the reasons Americans are taking to the highways this summer is the abundance, and low cost, of gasoline," said AIF President Carl Walske, "OPEC officials themselves acknowledge that nuclear energy is responsible for the permanent loss of market for about six million barrels a day of OPEC oil. What better time than this to learn how it happened?" Walske also pointed out that, "Many Americans are concerned about the accident at the Soviet nuclear power plant. A visit to one of ours will provide an opportunity to learn first-hand about U.S. safety features."

KG&E earns communication honors

● Kansas Gas & Electric Co. (KG&E) earned a "Forthright Communications" citation from Reddy Communications, Inc. in Reddy's annual electric utility industry report competition. KG&E was one of 130 companies competing for the citation. Judges said the report merited special attention because its design and execution fitted the company's situation.

CG&E completes life extension for electric generating unit

● Cincinnati Gas & Electric Co. (CG&E) said it has become the nation's first utility to complete a total life extension program for an electric generating unit. Unit 3 of CG&E's Beckjord Station, which began operating in 1954, was rejuvenated during a shutdown in October 1985. According to the company, Unit 3 was returned to service in January 1986 and is currently operating at its full 135 MW capability. CG&E estimates that the \$13 million life extension program should enable the unit to operate for another 25 years.

Johnson resigns as BPA administrator

● Bonneville Power Administration (BPA) Administrator Peter T. Johnson resigned last month citing personal reasons for leaving his five-year post, according to the Department of Energy. "As a key member of the Reagan Administration's energy team, Peter Johnson has helped enhance the financial stability and viability of the Bonneville Power Administration and the region it serves," said Secretary of Energy John S. Herrington. Herrington has named James J. Jura to succeed Johnson as administrator. Jura, formerly executive assistant administrator, has been with BPA since 1978.

Unthinking, uncaring or smug, CECo deserves customers' ire

When Commonwealth Edison's 2.7-million customers received their June bills, they received a double shock. Without notification or warning, the company initiated its summer rates, which are some 67-percent higher for the four summer months than the rest of the year. Moreover, the company added a new item on its bills—a monthly customer charge of \$10.64. The service charge was not explained, nor were customers warned ahead of time, creating a customer relations and credibility problem that may plague the utility for some time... Herein lies a lesson for the entire industry.

As a result of CECo's double whammy, bills of most customers jumped. Even without air conditioning being used, *EL&P* was told, bills have doubled...or more. Customers and organized consumer groups were outraged. They called CECo. They wrote letters. The newly formed Citizens' Utility Board swore action, and began by complaining to the media. Newspapers took up the torch...with banner headlines. Radio and TV joined in.

To add fuel to the fire, CECo spokespersons, when asked, evidenced surprise at all the furor. The company's summer rates have existed for several years, they said. And the customer charge has been included in the energy charges for some time; it just had never been pulled out of the total and identified. The charge was for meters and lines involved in serving customers, consumers and reporters were told.

No apologies. No attempt to explain why now, without warning, the service charge appeared on the bill. No explanation of why it had been included in the energy charge before, and now that it was taken out, why the rate for energy didn't seem to go down. To John Q. Customer, it was another case of Big Business putting it to the little guy...and if he doesn't like it, tough!

We find Commonwealth Edison's actions to be disappointing. Shouldn't common corporate courtesy have suggested a gentle warning note on a prior bill (CECo uses a two-part card bill, not a bill in an envelope) to encourage conservation in the light of the higher summer rates that were about to go into effect? Certainly, key executives in the past have always demonstrated a spirit of dedication to service and the interests of its customer. It is hard to reconcile that spirit with what was allowed to happen with summer billings. It is difficult to believe that company leadership would consciously allow something so obviously inflammatory as an unexplained service charge to be applied to their customers' bills without an explanation. But it happened. Summer rates just went into effect and the charge was applied. There was no explanation and there was no prior warning.

Are we to assume that CECo executives didn't know that the change to summer rates was being made without warning? Could something so pervasive and so sure to raise the ire of customers have been carried out without top management knowledge and approval? Did someone down the corporate ladder a rung or two forget that customers might want to know why they were being assessed a customer charge? Did they decide that commission approval of higher summer rates relieved them of any responsibility to warn customers of their imposition each year? Have they decided that CECo actions are above question? With several of its almost-finished nuclear units currently under a commission order to show cause why they should not be eliminated from rate base consideration because of lack of need and what their inclusion would do to customer rates in the future, wouldn't it have been in the company's self-interest to avoid further unnecessary customer irritation? Was company management ignorant of the effects of their actions? Or knowing of what was being done (or rather, not being done) did company management just not give a damn?

There is no question that utility economics and rates are complex and difficult to understand for the uninitiated. That complexity, plus the confusion and difficulty customers have in realizing how much electricity they actually use, makes it all the more important for utilities to continue efforts to inform customers about their rates, and about any changes in those rates.

It is said that ultimately we all get what we really deserve. If so, Commonwealth Edison is in for some trying times. They've certainly gone out of their way to earn them. For the balance of the industry the lesson should be clear: be considerate of your customers, keep them up-to-date on utility matters that will affect them and, especially, warn them in advance of any changes in services or rates they depend on and are used to.

Robert A. Lincicome, *EL&P* Editor-in-Chief

NERC projects peak growth

OVERVIEW 1986-1995 PROJECTIONS				
Demand				
	Summer	1986	1995	Annual Growth Rate (%)
Peak Hour Demands (Thousands of MW)	NERC-U.S.	475	577	2.2
	NERC-Canada	47	61	3.0
	NERC-Mexico	0.6	1.2	7.1
	NERC-Total	523	639	2.3
	Winter	1986/87	1995/96	
Peak Hour Demands (Thousands of MW)	NERC-U.S.	435	533	2.3
	NERC-Canada	65	83	2.8
	NERC-Mexico	0.4	0.8	7.1
	NERC-Total	500	618	2.4
	Annual	1986	1995	
Net Electrical Energy for Load (Millions of MWh)	NERC-U.S.	2,525	3,103	2.3
	NERC-Canada	350	462	3.1
	NERC-Mexico	3.0	5.6	7.3
	NERC-Total	2,878	3,571	2.4
Supply				
	Summer	1986	1995	Annual Growth Rate (%)
Planned Capacity Resources (Thousands of MW)	NERC-U.S.	636	715	1.3
	NERC-Canada	85	96	1.4
	NERC-Mexico	0.8	1.2	5.1
	NERC-Total	721	812	1.3
	Winter	1986/87	1995/96	
Planned Capacity Resources (Thousands of MW)	NERC-U.S.	655	727	1.2
	NERC-Canada	87	100	1.6
	NERC-Mexico	0.9	1.2	4.3
	NERC-Total	743	828	1.2

Source: "1986 Electric Power Supply & Demand," NERC, June 1986.

In an advance release of projections for the period of 1986-1995, the North American Electric Council predicts that aggregated peak hour demand for North America will grow at a rate of 2.4 percent a year. NERC said annual net energy for load will increase 2.3 percent a year in the U.S., while planned capacity additions will rise at a rate of only 1.3 percent a year over the period. A more detailed report will be published by NERC in the near future.

SCANA forms new subsidiary

COLUMBIA, SC—SCANA Corp., the parent of South Carolina Electric & Gas Co., is forming a new subsidiary to develop and market computer software systems and services. The new unit has begun operations under the name SCANA Software Services, Inc.

New technologies

According to John A. Warren, SCANA chairman and chief executive officer, corporate management is excited about the new operation be-

cause it will utilize existing in-house skills and, at the same time, be involved in new technologies. This, he said, will allow the company to "utilize products we've already developed and are in the process of developing."

SCANA president Lawrence M. Gressette, Jr., who also will serve as president of the new company, said the new company's products and services will be geared toward the electric utility industry, but not be limited to it. "We will be open to any venture that will be beneficial to SCANA," he said.

Low-cost venture

Gressette noted that the new diversification will be a low-cost, low-risk venture that will benefit both customers and shareholders since it will allow South Carolina Electric & Gas Co. to purchase software systems from the new company for less than the cost of developing those programs in-house.

Correction

An article in the June issue of *EL&P* entitled "Fluid-bed projects underway at T-NM Power, Montana-Dakota" (p.29) contained an error. Combustion Engineering, not Westinghouse, will supply the four 150 MW boilers for Texas-New Mexico Power Company's proposed fluidized-bed power plant.

Electric Light & Power

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Technical Publishing

a company of
The Dun & Bradstreet Corporation
Barrington, IL 60010 • (312) 381-1840

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THE TOP

100

electric utilities' 1985 operating performances

Don Minner
Associate Editor

Gas and oil consumption fell in 1985...coal usage rose...peak demand was higher...and generating capacity increased.

Those are among the highlights of *EL&P's* annual review of 1985 operating data from the nation's 100 largest investor-owned utilities. The information is taken from their Uniform Statistical Reports. Individual utility data are shown on the large tables on the following pages and summaries can be found in the smaller tables.

Fossil fuel consumption changes are highlighted in Table 1. Coal usage increased approximately 8 percent in 1985, a substantial change from 1984's decrease. According to the National Coal Association (NCA), coal now accounts for approximately 56 percent of all the electricity produced in the United States.

In its annual forecast, the association predicts that utility coal consumption will grow at a relatively slow pace of 1.5 percent per year to 1990, due to new nuclear plants coming on line, then will increase to 2.4 percent annually from 1990 to 2000. NCA believes that electricity generation will rise by 2.1 percent annually over the period. Because of an expected increase in nuclear capacity between 1984 and 1990, NCA predicts coal's share of electricity generation will drop from 55.8 percent to about 52.9 percent by 1990 before rising again.

Oil usage drops

Oil consumption decreased again last year for the top 100, although not as much as in 1984, reflecting the lower prices in late 1985. Gas usage, which had risen in 1984 for the first time in several years dropped last year. Even so, the gas industry has hopes that it can retain and improve its share of the electric utility market. After the oil price run-up in 1979 and 1980, gas usage rose until its price began increasing in 1982.

Daniel A. Dreyfus, an analyst with The Gas Research Institute, recently noted in a speech that electric utilities currently account for almost 20 percent of U.S. natural gas demand. He said that if oil prices continue to remain low, the emerging capacity shortfall in the 1990's will be addressed by greater operation of existing oil-fired capacity. Dreyfus point-

ed out that existing gas-fired capacity will also likely increase.

The Energy Information Administration predicted in its 1986 annual outlook for U.S. electric power that the oil and natural gas share of generation will drop from 16 percent in 1985 to 13 percent in 1988. EIA said their share is not expected to increase again until sometime in the 1990's, when new oil- and gas-fired turbines are used to meet peak demands.

Largest gas declines

Utilities with the largest declines in natural gas consumption in 1985 (among those consuming at least one billion cubic feet last year) were:

- Orange & Rockland Utilities...down 66 percent to 21.3 billion cubic feet,
- Dominion Resources...down 54 percent to 1.3 billion cubic feet,
- Kansas Power & Light...down 48 percent to 1.3 billion cubic feet,
- Public Service Electric & Gas...down 45 percent to 38.0 billion cubic feet,
- Sierra Pacific Power...down 33 percent to 3.3 billion cubic feet,
- El Paso Electric...down 32 percent to 14.6 billion cubic feet,
- Niagara Mohawk Power...down 20 percent to 18.2 billion cubic feet, and
- Commonwealth Energy...down 18 percent to 2.8 billion cubic feet.

Utilities that showed the largest declines in oil consumption last year (among those that burned at least one million barrels during the year) were:

- Commonwealth Edison...down 75 percent to 2.5 million barrels,
- Atlantic Electric...down 50 percent to 1.2 million barrels,
- FPL Group...down 48 percent to 11.5 million barrels,
- Philadelphia Electric...down 44 percent to 4.6 million barrels,
- Dominion Resources...down 40 percent to 1.4 million barrels,
- San Diego Gas & Electric...down 39 percent to 1.0 million barrels,
- United Illuminating...down 34 percent to 5.4 million barrels,
- Public Service of New Hampshire...down 31 percent to 2.4 million barrels,
- Orange & Rockland Utilities...down 28 percent to 1.3 million barrels, and
- Boston Edison...down 26 percent to 6.7 million barrels.

The EIA report says that coal and nuclear generation should provide most of the electricity generated in the nation from 1985 through 1995.

Coal use by the top 100 has been rising steadily since 1978's level of 420 million tons to 1985's 517 million tons. The coal industry is pinning much of its future hopes on the "clean coal" technologies currently being developed.

Congress's three-year, \$400 million Clean Coal Technology Program will provide financial assistance for developers of the technologies, which include fluidized bed combustion, gasification and flue gas desulfurization.

A Department of Energy request in Feb. 1985 for industry proposals resulted in the submission of 175 potential projects valued at more than \$8

billion. In April 1986, DOE received 51 proposals from industry for clean coal projects. DOE will announce who will receive the funds sometime this month.

Largest coal users

Here's how the largest coal users in the top 100 fared in 1985:

- Southern Company...up 11 percent to 44.0 million tons,
- American Electric Power...up 164 percent to 41.6 million tons,
- Texas Utilities...down 1 percent to 29.4 million tons,
- Detroit Edison...up 10 percent to 15.8 million tons,
- Allegheny Power...down 2 percent to 15.5 million tons,
- Commonwealth Edison...down 5 percent to 13.7 million tons,
- Central & South West...up 15 percent to 13.1 million tons,
- PacifiCorp...up 15 percent to 12.7 million tons, and
- Duke Power...up 4 percent to 10.3 million tons.

Median heat rate

The large table showing individual company fuel consumption also ranks the top 100 by system heat rate. Utility thermal efficiency continues to improve, sustaining a trend started several years ago. Beginning in 1982 when the median was 10,790 Btu/kWh, it has improved to 10,650 in 1983, 10,616 in 1984 and 10,605 in 1985.

As was true in the past several years, the most efficient utilities are generally the same with a few changes. Commonwealth Energy, which was the most efficient utility in 1985, 1984 and 1982, was ranked second in 1983 and 1981. Consumers Power which ranked second in 1985, has not been in the top five over recent years. Duke Power, which was the most efficient utility in 1983 and 1981, was ranked third in this year's review.

Although sometimes taken to task for publishing the heat rate rankings, *EL&P* believes that there are some utility systems similar enough to make meaningful comparisons. Also, because of the rankings, informal competitions between companies have been started that can only benefit the utilities.

The 20 most efficient base-loaded generating units in the country as reported in the Uniform Statistical Reports are shown in Table 4. Table 5 lists the leaders in fossil-boiler heat

TABLE 1
FOSSIL FUEL CONSUMPTION

	1984	Change	1985	Change
Coal (million tons)	477	-0.4%	517	+8.4%
Oil (million bbl)	190	-16.7%	171	-10.0%
Gas (billion cu ft)	2764	+6.9%	2644	-4.3%

TABLE 2
PEAK DEMAND AND RESERVE MARGINS

	1984	Change	1985	Change
Seasonal peak (MW)	383,377	+1.3%	393,264	+2.6%
Total system capability (MW)	476,664	+0.5%	481,053	+0.9%
System reserve margin	24.3%		21.9%	
Total owned capability (MW)	449,432	+1.4%	461,254	+2.6%
Owned reserve margin	17.2%		17.2%	
Average load factor	59.6		59.9	

TABLE 3
TYPE OF GENERATION (MW)

Type	1984	Change	1985	Change
Conventional steam and combined cycle	340,911	+0.7%	354,850	+4.1%
Hydro and pumped storage	24,731	+0.5%	27,987	+13.2%
Gas turbines and internal combustion	34,346	-8.4%	34,258	-0.3%
Nuclear	51,608	+10.7%	58,741	+13.8%
Total	451,596	+0.9%	475,836	+5.4%

HEAT RATES AND FUEL CONSUMPTION

Company	Rank	Heat Rate (Btu/kWh)	Up or Down	Fuel Consumption			Percent Change In		
				Coal (1000 tons)	Oil (1000 bbl)	Gas (1000 MCF)	Coal	Oil	Gas
Commonwealth Energy	1	9,711	U	0	6,779	2,788	-	-6	-18
American Electric Power	2	9,882	D	41,567	0	24	+64	-100	+100
Duke Power	3	9,900	U	10,255	7,491	152	+4	-	-17
Dayton Power & Light	4	9,910	D	4,516	6	164	+2	-25	+42
Florida Progress (FPC)	5	9,928	D	5,051	6,886	7,950	+32	+47	+36
Cincinnati Gas & Electric	6	9,971	D	7,426	864	87	+2	+130	+2
Detroit Edison	7	9,990	-	15,670	688	10,574	+10	-6	+31
Allegheny Power	8	10,016	D	15,501	0	0	-2	-	0
Consumers Power	9	10,020	U	6,037	201	301	-4	-39	-16
Southwestern Public Service	10	10,025	D	6,993	8	45,127	+37	-50	-38
United Illuminating	11	10,054	U	774	5,361	0	+100	-34	0
New York State Electric & Gas	12	10,093	D	6,051	14	0	+18	-33	0
New England Electric*	13	10,117	U	2,967	7,941	2,532	-9	+3	-32
SCANA*	13	10,117	U	4,025	10	289	+7	-	+72
Toledo Edison	15	10,124	D	2,260	3	78	+12	-25	-14
Illinois Power	16	10,158	U	7,663	65	303	+5	-11	-18
Public Service of Indiana	17	10,186	U	11,920	2	0	-10	+100	0
Southern Company	18	10,187	D	44,035	180	6,094	+11	+227	+42
Central Illinois Light	19	10,223	D	2,145	0	7	0	0	-80
Teco Energy	20	10,246	D	6,210	702	0	+23	-47	0
Potomac Electric	21	10,268	U	6,141	3,915	0	-8	+16	0
Carolina Power & Light	22	10,286†	U	9,359	90	1,139	-12	+500	+37
Union Electric	23	10,305	U	10,148	24	343	-14	-35	-31
Houston Industries	24	10,331	U	10,481	56	329,865	+13	+22	-9
Sierra Pacific Resources	25	10,332	U	687	9	3,252	+53	+50	-1
Central Hudson Gas & Electric	26	10,339	U	0	5,424	4,720	0	-10	-7
Central & South West	27	10,365	D	13,055	173	280,422	+15	+10	-4
Long Island Lighting	28	10,368	D	0	15,946	28,083	-	+3	-4
Cleveland Electric Illuminating	29	10,387	D	6,699	143	0	+8	+93	-
Midwest Energy	30	10,393	D	1,923	9	317	+3	-31	-12
Boston Edison	31	10,409	U	0	6,724	33,721	-	-26	+69
Utah Power & Light	32	10,411	D	8,050	87	225	+6	-	-26
Eastern Utilities Associates	33	10,420	U	516	2,680	54	+32	-2	+100
Central Illinois Public Service	34	10,451	D	5,106	14	0	-3	-52	0
Pennsylvania Power & Light	35	10,469	U	10,987	7,473	0	-1	+8	0
Hawaiian Electric	36	10,473	U	0	10,701	0	0	0	0
Gulf States Utilities	37	10,502	D	2,633	38	145,803	+50	-42	-1
Wisconsin Power & Light	38	10,509	D	3,628	22	49	-10	-55	-46
Dominion Resources	39	10,510	D	8,025	1,415	1,303	-6	-40	-54
Idaho Power	40	10,512	D	3,097	1	21	+49	-	-
IPALCO	41	10,521	U	4,830	79	0	-7	68	-1
Louisville Gas & Electric	42	10,532	D	3,743	0	327	+3	-	-63
Niagara Mohawk Power	43	10,539	U	2,970	5,016	18,187	-7	-22	-20
Atlantic Electric	44	10,548	U	1,070	1,159	72	-10	-50	-95
Central Louisiana Electric	45	10,557	D	683	0	40,150	-3	-100	+37
Pacific Gas & Electric	46	10,571	D	0	810	265,146	-	-3	+7
Savannah Gas & Electric	47	10,572	U	855	38	487	+1	+192	-1
Orange & Rockland	48	10,574	U	0	1,327	21,281	0	-28	-66
Ohio Edison	49	10,600	U	11,496	22	0	+9	+5	0
Delmarva Power & Light	50	10,605	U	2,751	2,480	5,742	-6	-23	+8
Baltimore Gas & Electric	51	10,608	D	3,460	2,031	841	+5	-13	+15
Central Maine Power	52	10,610	D	0	2,378	0	0	-5	0
Southern California Edison	53	10,615	D	3,170	2,331	274,917	-39	+111	+21
Kansas City Power & Light	54	10,635	D	5,426	88	246	-6	-7	-68
Public Service of New Hampshire	55	10,640	U	1,428	2,429	0	+19	-31	0
General Public Utilities	56	10,647	U	7,109	671	11,456	+3	-48	-57
Rochester Gas & Electric	57	10,667	U	771	489	38	-3	+16	-80
Southern Indiana Gas & Electric	58	10,679	U	2,072	0	171	-1	0	-58
Duquesne Light	59	10,680	D	4,649	117	0	0	+50	-100
Northern States Power	60	10,682	D	7,545	32	448	+1	+10	-2
Public Service Electric & Gas	61	10,712	U	4,295	7,052	37,991	+17	+18	-45
FPL Group (F&L)	62	10,734	U	0	11,547	113,762	0	-48	+5
Northeast Utilities	63	10,753	D	381	12,007	4,667	-6	-7	-18
San Diego Gas & Electric	64	10,779	U	NA	1,075	43,242	0	-39	-11
Madison Gas & Electric	65	10,785	D	768	4	784	-7	-20	-27
Tucson Electric Power	66	10,783	D	2,169	0	4,500	-4	-100	+86
Public Service of Colorado	67	10,828	D	6,842	30	1,308	-5	+15	-12
Pacificorp	68	10,838	D	12,711	69	0	+15	-7	0
Philadelphia Electric	69	10,839	D	2,576	4,620	1,038	+2	-44	-10
Iowa-Illinois Gas & Electric	70	10,842	D	1,882	12	805	-3	-14	-4
Kentucky Utilities*	71	10,844	U	4,838	1	2	+12	-50	-
Utilicorp United*	71	10,844	U	1,264	2	14	-13	-75	-82
Middle South Utilities*	73	10,847	D	7,846	229	230,982	+59	-22	-10
Northern Indiana Public Service*	73	10,847	D	4,320	45	751	-7	+10	-15
Washington Water Power	75	10,853	D	1,097	1,507	5,762	+6	-	-
Nevada Power	76	10,867	D	2,267	72	3,360	-12	+67	+4
Wisconsin Electric Power	77	10,875	U	6,153	145	246	+3	+44	-54
Oklahoma Gas & Electric	78	10,896	U	6,505	20	108,969	+2	-38	-9
AEP Group	79	10,910	U	6,353	169	16,538	-16	+360	+103
Wisconsin Public Service	80	10,918	U	3,058	30	27	+1	-62	+4
Iowa Resources	81	10,954	D	2,072	14	406	+4	+17	-39
El Paso Electric	82	10,970	U	284	1	14,628	-28	-	-32
Minnesota Power	83	10,992	U	3,291	0	0	-16	0	0
Texas Utilities	84	11,009	U	29,374	955	402,048	-1	+135	+10
Empire District Electric	85	11,041	U	1,188	7	596	-2	+17	-4
Puget Sound Power & Light	86	11,064	D	2,294	7	82	+8	+86	+244
Commonwealth Edison	87	11,126	U	13,885	2,535	3,636	-5	-75	+31
Consolidated Edison	88	11,129	D	0	15,088	82,593	0	-14	-6
Portland General Electric	89	11,166	U	862	1	0	-12	+100	-
Interstate Power	90	11,171	D	2,121	13	531	+8	-28	-44
Kansas Gas & Electric	91	11,184	U	2,922	1	11,863	-17	-	-41
Public Service of New Mexico	92	11,214	U	4,231	7	1,380	+5	-82	-
Montana Power	93	11,233	U	2,438	25	443	+24	+108	+28
Kansas Power & Light	94	11,298	D	5,944	15	1,279	+1	-44	-48
Iowa Electric Light & Power	95	11,502	D	931	14	133	+34	-7	-43
Otter Tail Power	96	11,700	U	2,057	2	0	+6	+50	0
Centel	97	12,219	D	874	3	4,594	+2	-40	-13
MDU Resources	98	12,309	D	1,574	8	15	+3	+3	-42
Central Vermont Public Service	99	13,229	U	88	46	0	+48	-2	0
TNP Enterprises	100	120,000	U	0	0	7	0	0	-69

*Tie †Doesn't include heat recovery of 768 MWH.

*Includes 586 barrels of coal/oil mixture.

*Wood

rate. (The effect on heat rates of nuclear units, gas turbines, and diesel engines is eliminated.)

In the second large table you will find data, summarized in Table 2, that shows peak demand rose a modest 2.6 percent in 1985. Continuing economic growth and a winter cold wave that gripped much of the country helped lead to the increase in peak demand.

Peak demand leaders

Leaders in peak demand growth were:

- Teco Energy...up 26.1 percent to 2,738 MW.
- FPL Group...up 22.0 percent to 12,533 MW.
- Florida Progress...up 19.7 percent to 5,813 MW.
- Dominion Resources...up 16.0 percent to 10,316 MW.
- Carolina Power & Light...up 14.4 percent to 7,502 MW.
- Duke Power...up 14.8 percent to 12,687 MW.
- El Paso Electric...up 13.0 percent to 877 MW.
- Public Service New Hampshire...up 12.9 percent to 1,357 MW.
- Atlantic Electric...up 10.6 percent to 1,432 MW, and
- Delmarva Power & Light...up 10.2 percent to 1,739 MW.

At press time, *EL&P* had just received Boston Edison's Uniform Statistical Report. In the USR, the company said its season peak was 2,416 MW, a 1.2% increase. However in its FERC 1 report, where we found the peak statistics for our tables, Boston Edison said its peak was 2,684 MW, a 12.4% rise.

1985 gains higher

The 1985 gains in peak demand were much higher than in 1984. Seven utilities made the top ten in 1984 with average gains of approximately 6 percent, while the tenth utility in 1985 had a 10.6 percent increase.

Summer weather was mild again in

TABLE 4
TOP GENERATING UNITS—
BY HEAT RATE
(CF > 50%)

Unit	Capacity (MW)
1. Belevs Creek 2	1,120
2. Marshall 3	630
3. Marshall 4	630
4. Canal 1	568
5. Marshall 1	385
6. Amos 2	800
7. Marshall 2	385
8. Campbell 3	719
9. Moss Landing 7	739
10. Morgantown 2	582
11. Trenton Channel 1	500
12. Crystal River 5	717
13. Campbell 1	265
14. Bay Shore 1	136
15. Sporn 5	450
16. Crystal River 4	717
17. Monroe 1	750
18. Bay Shore 3	142
19. Stuart 1	205
20. McMeekin 2	126

1985, but winter weather was more severe than in 1984. Winter peakers almost doubled from 1984's 17 to 30.

Seven of the top ten peak demand leaders are utilities located in the South; six of those are winter peakers, and the top three are Florida utilities. A January 1985 cold wave hit Florida and most of the South.

Continuing a trend that began in 1982, average load factor (unweighted) for the top 100 improved. Last year's 59.9 load factor compares with 59.6 in 1984, 57.7 in 1983 and 57.5 in 1982.

Generating capacity rose

Generating capacity rose modestly in 1985. The top 100's system capability growth rate slowed last year. In the past six years, the group averaged an increase of about 5,000 MW a year. But in 1985, system capability rose only about 4,400 MW.

System reserve margin continues its fall from a 1982 high of 29 percent to 22 percent in 1985. That follows a trend that began when the last recession bottomed out—system reserve margins of the 100 largest IOUs have been dropping at the rate of approximately two percentage points a year. This lends credence to the belief of many that now is the time to begin planning for future capacity additions.

The North American Electric Reliability Council says that it believes the installed generating capacity in the U.S. will be near the minimum acceptable levels in some regions by 1994.

In its forecast, the Energy Information Administration said capacity should grow at a rate of 1.2 percent a year, less than half the 2.7 percent a year growth predicted for electric energy demand. NERC predicts that summer peak demand in 1986 will be 475,000 MW and winter peak will hit 577,000 MW.

EIA reports that capacity will grow

PEAK DEMAND AND CAPABILITY

Company	Season Peak MW	% Change	Winter (W) or Summer (S)	Total System Capacity MW (at time of peak)	Total System Reserve %	Owned Capacity MW (at time of peak)	Owned Reserve %	Load Factor %
Allegheny Power Systems	6,035	+9.6	W	7,109	18	7,109	18	63.3
American Electric Power	20,263	-2.0	W	21,669	7	22,827	13	60.8
Atlantic Electric	1,432	+10.6	S	1,606	12	1,481	3	54.5
AZP Group	3,198	+7.7	S	3,257	2	3,029	-5	54.2
Baltimore Gas & Electric	4,365	+3.2	S	5,586	28	5,380	23	55.4
Boston Edison	2,884	+12.4	S	NA	NA	2,780	4	NA
Carolina Power & Light	7,502	+14.4	W	8,759	17	8,635	15	54.6
Centel	506	+4.8	S	NA	NA	661	9	NA
Central & South West	9,802	-0.3	S	12,832	31	12,729	30	58.2
Central Hudson Gas & Electric	739	+7.3	S	1,043	41	980	33	65.6
Central Illinois Light	834	-10.7	S	1,191	43	1,264	52	62.4
Central Illinois Public Service	1,653	-7.1	S	2,864	73	2,809	70	62.0
Central Louisiana Electric	1,065	+5.4	S	1,388	30	1,361	28	57.1
Central Maine Power	1,375	+6.8	W	1,557	13	965	-30	69.7
Central Vermont Public Service	420	+2.4	W	457	9	98	-77	64.0
Cincinnati Gas & Electric	3,316	+6.7	S	4,030	22	4,030	22	58.0
Cleveland Electric Illuminating	3,257	-3.4	S	3,244	0	3,244	0	67.5
Commonwealth Edison	13,255	-9.0	S	19,627	48	19,003	43	60.0
Commonwealth Energy	772	+9.8	S	837	8	225	-71	60.7
Consolidated Edison	7,670	+3.2	S	10,283	34	9,455	23	48.8
Consumers Power	4,733	-2.2	S	5,991	27	6,280	33	69.3
Dayton Power & Light	2,269	+7.7	W	2,687	18	2,687	18	58.5
Delmarva Power & Light	1,739	+10.2	S	2,223	28	2,223	28	60.5
Detroit Edison	7,172	-2.4	S	9,367	31	9,325	30	63.3
Dominion Resources	10,316	+16.0	W	11,071	7	10,353	0	54.4
Duke Power	12,687	+14.8	W	13,782	9	13,594	7	55.8
Duquesne Light	2,127	-2.1	S	2,692	27	3,063	44	63.3
Eastern Utilities Associates	738	+3.1	S	830	13	539	-27	58.8
El Paso Electric	877	+13.0	S	989	13	989	13	61.3
Empire District Electric	543	+3.6	S	624	15	622	15	55.0
Florida Progress (FPC)	5,813	+19.7	W	6,199	7	5,744	-1	43.9
FPL Group (FPL)	12,533	+22.0	W	11,889	-5	14,017	12	51.0
General Public Utilities	6,691	+4.5	S	9,606	44	7,807	17	NA
Gulf States Utilities	5,139	-6.1	S	6,610	29	6,034	-17	68.0
Hawaiian Electric	1,147	+1.4	W	1,537	34	1,495	30	71.9
Houston Industries	10,618	-2.1	S	13,913	31	12,318	16	60.0
Idaho Power	2,298	+4.5	S	2,717	18	2,537	10	61.0
Illinois Power	2,771	-13.8	S	3,519	27	3,770	36	64.3
Interstate Power	728	-3.4	S	953	29	950	29	63.6
Iowa Electric Light & Power	922	-4.7	S	1,148	25	1,048	14	56.7
Iowa Resources	1,110	-4.0	S	1,719	55	1,331	20	50.3
Iowa Illinois Gas & Electric	965	-2.9	S	1,531	59	1,534	59	51.7
IPALCO	2,044	0	S	2,396	17	2,396	17	59.9
Kansas City Power & Light	2,235	-2.7	S	2,937	31	2,937	31	49.0
Kansas Gas & Electric	1,549	-0.8	S	2,466	59	2,453	58	53.1
Kansas Power & Light	1,728	-4.1	S	2,552	48	2,672	55	52.0
Kentucky Utilities	2,453	+11.9	W	3,298	34	3,175	29	54.6
Long Island Lighting	3,380	+9.1	S	NA	NA	3,709	10	NA
Louisville Gas & Electric	1,812	+3.6	S	2,262	25	2,262	25	53.2
Madison Gas & Electric	410	-4.0	S	590	44	587	43	56.0
MDU Resources Group	350	-1.4	S	424	21	410	17	59.8
Middle South Utilities	10,870	+4.0	S	15,342	41	15,281	41	59.8
Midwest Energy	692	-9.9	S	1,245	80	1,245	80	53.9
Minnesota Power	1,059	+0.8	S	1,658	57	1,395	32	76.0
Montana Power	1,295	+6.1	W	1,511	17	1,314	2	99.0
Nevada Power	1,847	+7.2	S	1,903	16	1,741	6	48.7
New England Electric	3,556	+5.2	S	4,237	19	3,886	9	60.6
New York State Electric & Gas	2,290	+2.0	W	3,058	34	2,437	6	64.4
Niagara Mohawk Power	5,862	-6.0	W	7,803	33	5,320	-9	66.1
Northeast Utilities	4,340	+2.5	W	5,899	35	6,264	44	61.8
Northern Indiana Public Service	2,116	-6.9	S	3,452	63	3,052	44	62.0
Northern States Power	5,205	-6.1	S	6,788	30	6,057	16	68.8
Ohio Edison	4,084	-0.2	W	5,550	36	5,402	32	68.4
Oklahoma Gas & Electric	4,450	-5.3	S	5,702	28	5,656	27	51.3
Orange & Rockland Utilities	790	+2.9	S	1,011	28	1,011	28	50.3
Otter Tail Power	556	+1.8	W	594	7	582	5	58.9
Pacific Gas & Electric	14,403	+1.3	S	18,686	30	13,925	-3	60.4
Pacificorp	4,253	+0.2	W	5,517	30	3,919	-8	63.0
Pennsylvania Power & Light	4,981	-9.7	W	7,513	51	8,360	68	56.9
Philadelphia Electric	6,034	+1.8	S	6,190	3	7,599	26	57.7
Portland General Electric	2,899	+1.3	W	4,085	41	2,555	-12	55.9
Potomac Electric Power	4,682	+4.3	S	5,375	15	5,375	15	51.2
Public Service Electric & Gas	7,721	+4.0	S	9,040	17	8,999	17	51.6
Public Service of Colorado	3,054	+2.9	S	3,983	30	3,021	-1	70.9
Public Service of Indiana	3,673	+0.3	W	5,921	61	5,687	55	61.5
Public Service of New Hampshire	1,357	+12.9	W	1,666	23	1,285	-5	59.9
Public Service of New Mexico	861	-11.8	S	1,382	61	1,307	52	64.4
Puget Sound Power & Light	3,573	+2.6	W	4,141	16	1,647	-54	52.0
Rochester Gas & Electric	1,076	+0.1	S	1,511	40	1,133	5	65.4
San Diego Gas & Electric	2,334	-0.3	S	2,879	23	2,471	6	57.1
Savannah Electric & Power	498	+3.5	S	670	35	600	21	54.7
SCANA Corp.	2,703	+4.1	W	3,949	46	3,969	47	59.0
Sierra Pacific Resources	712	+0.6	S	904	27	814	14	70.8
Southern California Edison	14,587	-4.0	S	17,349	19	14,544	0	55.9
Southern Company	21,388	+7.7	S	24,932	17	25,607	20	57.4
Southern Indiana Gas & Electric	898	-0.4	S	917	2	917	2	67.4
Southwestern Public Service	2,864	+3.7	S	4,181	46	3,981	39	65.6
Teco Energy	2,738	+26.1	W	2,593	-6	2,593	-6	52.1
Texas Utilities	15,898	+4.1	S	18,614	17	17,804	12	56.2
TNP Enterprises	NA	NA	NA	NA	NA	NA	NA	NA
Toledo Edison	1,374	+3.5	W	1,754	28	1,711	25	66.7
Tucson Electric Power	1,118	+8.4	S	1,387	24	1,330	19	57.2
Union Electric	5,999	-8.3	S	7,898	32	7,764	29	56.0
United Illuminating	1,110	+11.1	S	1,170	5	1,170	5	56.7
Utah Power & Light	3,260	+1.0	W	2,925	-10	3,162	-3	71.8
Utilicorp United	718	-3.2	S	910	27	910	27	47.0
Washington Water Power	1,522	+3.6	W	1,875	10	1,340	-12	54.0
Wisconsin Electric Power	3,524	-4.3	S	4,575	30	4,575	30	84.0
Wisconsin Power & Light	1,371	-3.9	S	1,931	41	1,880	38	67.4
Wisconsin Public Service	1,220	+1.4	W	1,735	42	1,723	41	74.0

Heat rate (Btu/kWh)

Duke Power	8,900
Duke Power	8,959
Duke Power	9,036
Commonwealth Energy	9,107
Duke Power	9,140
American Electric Power	9,157
Duke Power	9,160
Consumers Power	9,165
Pacific Gas & Electric	9,207
Potomac Electric	9,209
Detroit Edison	9,220
Florida Progress	9,242
Consumers Power	9,256
Toledo Edison	9,259
American Electric Power	9,273
Florida Progress	9,289
Detroit Edison	9,312
Toledo Edison	9,323
Dayton Power & Light	9,326
SCANA	9,343

"Top 100 nuclear capacity continued growing. It increased 13.8 percent in 1985..."

much more slowly than electricity demand, because existing capacity will be adequate to meet most demand growth.

New nuclear, coal-fired, hydro, and pumped storage capacity were substantially higher in 1985 than in the previous year, as shown in Table 3. Gas turbine and internal combustion capacity declined slightly. Hydro and pumped storage capacity rose approximately 13 percent and gas turbine and internal combustion capacity went from -8.4 percent in 1984 to -9.3 percent in 1985.

Top 100 nuclear capacity continued growing. It increased 13.8 percent in 1985, 11 percent in 1984 and 8 percent in 1983.

Two top 100 utilities that are co-owners of the troubled Davis-Besse nuclear plant in Ohio apparently disagreed as to whether the plant is available or not. Toledo Edison lists the plant as part of its generating capability, while Cleveland Electric Illuminating has eliminated its share of Davis Besse from its capability. The unit has been shut down the past year.

According to figures compiled by the Atomic Industrial Forum, 11 new reactors totaling 11,981 MW of capacity are scheduled to come on-line this year. In 1985 seven new reactors totaling 7,903 MW entered commercial operation. Seven new reactors also began operation in 1984 that totaled 7,907 MW.

Leading nuclear utilities

- The leading nuclear utilities:
- Commonwealth Edison...8,127 MW,
 - Duke Power...6,085 MW,
 - Middle South Utilities...3,923 MW,
 - Dominion Resources...3,135 MW,
 - FPL Group (FP&L)...2,871 MW,
 - Southern Company...2,394 MW,
 - General Public Utilities...2,334 MW,
 - American Electric Power...2,130 MW,
 - Carolina Power & Light...1,955 MW,
 - Southern California Edison...1,962 MW,
 - Pennsylvania Power & Light...1,890 MW,
 - Public Service Electric & Gas...1,817 MW,
 - Philadelphia Electric...1,816 MW,

**TABLE 5
SYSTEM HEAT RATE
LEADERS—FOSSIL-FUELED
BOILERS ONLY**

Utility	Heat rate (Btu/kWh)
1. Duke Power	9,300
2. Consumers Power	9,578
3. Commonwealth Energy	9,707
4. Florida Progress (FPC)	9,782
5. American Electric Power	9,795
6. Dayton Power & Light	9,907
7. SCANA Corp.	9,918
8. Cincinnati Gas & Electric	9,960
9. Toledo Edison	9,981
10. Allegheny Power Systems	10,016

TYPE OF GENERATION IN THE SYSTEM

Company	Fossil			Hydro & Pump Storage			Combustion Turbines			Nuclear		
	MW	%	Last Year Change MW	MW	%	Last Year Change MW	MW	%	Last Year Change MW	MW	%	Last Year Change MW
Allegheny Power Systems	7,036	89	-11	902	11	+840	0	0	0	0	0	0
American Electric Power	19,800	87	0	836	4	0	61	1	-24	2,130	9	0
Atlantic Electric	842	57	+42	0	0	0	368	25	0	319	18	0
AZP Group	2,523	83	-121	6	1	0	501	16	0	0	0	0
Baltimore Gas & Electric	3,038	56	0	0	0	0	757	14	+50	1,650	30	0
Boston Edison	1,871	67	+64	0	0	0	239	8	-8	670	24	0
Carolina Power & Light	5,068	81	0	218	3	+4	1,018	12	0	1,955	24	0
Central	555	84	+16	0	—	—	108	16	+12	0	—	—
Central & South West	12,729	100	-30	0	0	0	0	0	0	0	0	0
Central Hudson Gas & Electric	899	92	+5	43	4	0	38	4	+5	0	0	0
Central Illinois Light	1,106	97	-149	0	0	0	30	3	-2	0	0	0
Central Illinois Public Service	2,806	99	+33	0	0	0	3	1	+3	0	0	0
Central Louisiana Electric	1,361	100	0	0	0	0	0	0	0	0	0	0
Central Maine Power	590	61	0	331	34	+8	44	5	+1	0	0	0
Central Vermont Public Service	25	26	+1	41	42	+1	32	32	0	0	0	0
Cincinnati Gas & Electric	3,555	88	0	0	0	0	475	12	0	0	0	0
Cleveland Electric Illuminating	2,877	89	-3	305	9	0	62	2	0	0	0	-447
Commonwealth Edison	9,703	49	0	624	4	0	1,331	7	0	8,127	41	+1,120
Commonwealth Energy	1,024	94	+1	0	0	0	62	6	0	0	0	0
Consolidated Edison	6,417	69	-135	0	0	0	2,075	22	+25	849	9	0
Consumers Power	4,045	64	-148	1,089	17	0	357	6	-120	789	13	-37
Dayton Power & Light	2,291	92	0	0	0	0	210	8	+27	0	0	0
Delmarva Power & Light	1,788	79	51	0	0	0	170	7	0	319	14	0
Detroit Edison	7,830	87	+599	918	10	0	525	3	-5	0	0	0
Dominion Resources	6,147	54	+127	1,586	14	+1,260	550	5	+111	3,135	27	+11
Duke Power	6,603	45	0	1,422	10	+30	599	4	0	6,085	41	+1,145
Duquesne Light	2,763	88	0	0	0	0	0	0	0	385	12	0
Eastern Utilities Associates	509	92	0	0	0	0	47	8	0	0	0	0
El Paso Electric	920	93	0	0	0	0	99	7	0	0	0	0
Empire District Electric	412	66	0	18	3	0	195	31	0	0	0	0
Florida Progress (FPC)	4,177	71	+27	0	0	0	1,083	18	-488	667	11	-94
FPL Group (FP&L)	8,893	67	+707	0	0	0	1,950	15	-27	2,871	18	+48
General Public Utilities	4,129	50	+28	345	4	+12	1,487	18	0	2,334	28	-22
Gulf States Utilities	5,821	92	-443	0	0	0	90	2	0	0	0	0
Hawaiian Electric	1,274	86	0	0	0	0	220	14	+1	0	0	0
Houston Industries	11,192	89	+91	0	0	0	1,184	11	+10	0	0	0
Idaho Power	992	38	+134	1,576	80	-95	50	2	0	0	0	0
Illinois Power	3,562	95	0	2	—	—	176	5	+2	0	0	0
Interstate Power	895	94	0	0	0	0	55	6	0	0	0	0
Iowa Electric Light & Power	541	52	0	0	0	0	157	15	+1	350	33	0
Iowa Resources	1,054	79	0	0	0	0	275	21	0	0	0	0
Iowa-Illinois Gas & Electric	1,081	70	4	3	1	0	67	4	-1	384	25	0
IPALCO	2,322	97	0	0	0	0	74	3	0	0	0	0
Kansas City Power & Light	2,037	69	-70	0	0	0	370	13	0	530	18	+530
Kansas Gas & Electric	1,880	77	-180	0	0	0	23	1	0	530	22	+530
Kansas Power & Light	2,191	87	-151	0	0	0	339	13	0	0	0	0
Kentucky Utilities	3,090	97	+2	25	1	+1	56	2	0	0	0	0
Long Island Lighting	12,075	98	—	0	0	0	217	2	—	0	0	0
Louisville Gas & Electric	2,133	95	0	79	1	+79	108	4	+1	0	0	0
Madison Gas & Electric	406	69	0	0	0	0	98	15	+4	94	16	-1
MDU Resources Group	349	80	+1	0	0	0	86	20	0	0	0	0
Middle South Utilities	12,143	73	+521	70	1	+1	537	3	+150	3,923	23	+2,229
Midwest Energy	1,038	83	-15	0	0	0	207	17	-2	0	0	0
Minnesota Power	1,280	92	-5	109	8	0	0	0	0	0	0	0
Montana Power	789	60	0	520	40	0	5	—	0	0	0	0
Nevada Power	1,312	75	0	0	0	0	429	26	-9	0	0	0
New England Electric	2,658	68	+9	1,175	30	0	57	2	+1	0	0	0
New York State Electric & Gas	2,366	97	-10	65	2	+5	7	1	-1	0	0	0
Niagara Mohawk Power	3,706	70	0	617	12	-77	310	7	+59	610	11	+32
Northeast Utilities	2,485	43	0	1,275	22	0	482	9	+19	1,520	26	0
Northern Indiana Public Service	2,801	92	0	10	1	0	241	7	0	0	0	0
Northern States Power	3,298	54	+34	179	4	-45	988	16	+60	1,547	26	+8
Ohio Edison	4,813	89	+22	0	0	0	164	3	+25	425	8	0
Oklahoma Gas & Electric	5,597	99	-1	0	0	0	59	1	0	0	0	0
Orange & Rockland Utilities	902	89	0	34	3	0	74	7	0	0	0	0
Orter Tail Power	506	85	+2	4	1	0	87	15	0	0	0	0
Pacific Gas & Electric	8,574*	61	+47	3,695	26	+1,183	394	4	0	1,199	9	+1,199
Pacificorp	3,052	75	0	975	24	0	0	0	0	27	1	0
Pennsylvania Power & Light	5,785	89	0	146	1	0	539	8	0	1,890	23	+945
Philadelphia Electric	3,201	42	-166	1,290	17	0	1,280	17	0	1,816	24	0
Portland General Electric	1,130	44	0	601	23	0	116	5	+6	729	28	0
Potomac Electric Power	4,809	89	0	0	0	0	652	11	+86	0	0	0
Public Service Electric & Gas	4,312	48	0	165	2	0	2,713	30	+13	1,817	20	0
Public Service of Colorado	2,549	84	+87	85	3	-181	187	6	+1	200	7	0
Public Service of Indiana	5,411	95	0	55	1	0	221	4	0	0	0	0
Public Service of New Hampshire	1,098	85	+2	69	6	0	118	9	0	0	0	0
Public Service of New Mexico	1,281	98	-38	0	0	0	26	2	0	0	0	0
Puget Sound Power & Light	683	40	0	310	19	0	703	41	+1	0	0	0
Rochester Gas & Electric	587	52	0	47	4	0	29	3	0	470	41	0
San Diego Gas & Electric	1,854	69	0	0	0	0	333	12	0	617	19	+2
Savannah Electric & Power	537	88	0	0	0	0	72	12	0	0	0	0
SCANA Corp.	2,286	39	-132	756	19	0	110	7	+75	590	15	-10
Sierra Pacific Resources	716	88	+125	12	1	0	87	11	+1	0	0	0
Southern California Edison	10,072	69	+298	942	6	+13	1,620	12	+12	1,962	13	0
Southern Company	19,586	76	+653	2,604	10	+219	1,131	4	0	2,394	10	+19
Southern Indiana Gas & Electric	782	85	0	0	0	0	135	15	0	0	0	0
Southwestern Public Service	3,945	97	+465	0	0	0	106	3	0	0	0	0
Taco Energy	2,882	96	+427	0	0	0	158	5	0	0	0	0
Texas Utilities	17,804	100	0	0	0	0	0	0	0	0	0	0
TNP Enterprises	0	0	-39	0	0	0	49	100	+27	0	0	0
Toledo Edison	1,213	71	+14	0	0	0	77	4	+11	421	25	-2
Tucson Electric Power	1,113	84	+5	0	0	0	218	16	0	0	0	0
Union Electric	5,580	72	+1	631	8	0	386	6	+5	1,109	14	-11
United Illuminating	1,124	92	-96	0	0	0	22	2	0	0	0	0
Utah Power & Light	2,996*	95	-44	127	4	0	19	1	0	0	0	0
Utilicorp United	650	71	+40	0	0	0	268	29	0	0	0	0
Washington Water Power	344	25	0	946	68	0	101	7	0	0	0	0
Wisconsin Electric Power	3,267	72	+866	7	0	0	263	6	-25	970	22	0
Wisconsin Power & Light	1,457	77	266	42	2	0	177	9	+1	215	11	+1
Wisconsin Public Service	1,280	73	+35	56	3	+2	189	11	+32	217	13	+2

*Includes geothermal capacity.

Canadian electrical use exceeded 1985 estimates

MONTREAL—Consumption of electricity in Canada rose 5.8 percent to a record 407-billion kilowatthours in 1985, reflecting a continuing resurgence of the Canadian economy.

The increase more than doubled the 2.6 percent growth projected for the year, and indicates solid growth in each of the country's provinces. As a result of increased load forecasts, the projected national growth rate until 1990 has been raised to 3.3 percent.

The improvement in electrical usage was reported in a presentation at the Canadian Electric Association's

spring meeting by the Department of Energy, Mines and Resources.

Exports gained 10.7 percent

The report indicated that exports of electricity to the U.S., which represent about 10 percent of Canadian electrical demand, rose 10.7 percent, to 41.3-billion kWh. About 30 percent of the exports were sold under firm power contracts, up from about 14 percent of all exports five years ago.

Two-thirds of the exports were hydroelectric generation-based. Net revenues from exports climbed to

\$1.4-billion, a gain of 10.9 percent. British Columbia and Saskatchewan led in gains, BC increasing its exports by 142 percent, to 410.7 billion kWh, and Saskatchewan gaining by 115 percent. Ontario and Quebec, normally accounting for about 60 percent of exports, lost ground, falling 16 and 15 percent, respectively. BC now is providing about 26 percent of Canadian power exports to the U.S.

Generating capacity increases

Canadian generating capacity gained 3.5 percent in 1985. Eleven

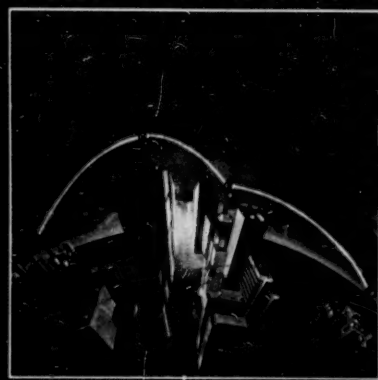
new units came on-line. Ontario Hydro led in capacity additions with its 206 MW of coal-fired capacity and 1346 MW of new nuclear facilities in two units. Hydro Quebec added 1178 MW of hydro capacity on James Bay and BC Hydro, Saskatchewan Power and Newfoundland and Labrador Hydro added 716 MW in three hydroelectric facilities.

Hydro power now accounts for 57 percent of total Canadian capacity. Conventional thermal capacity fell to 31 percent and nuclear totalled 11 percent.

Capital spending down

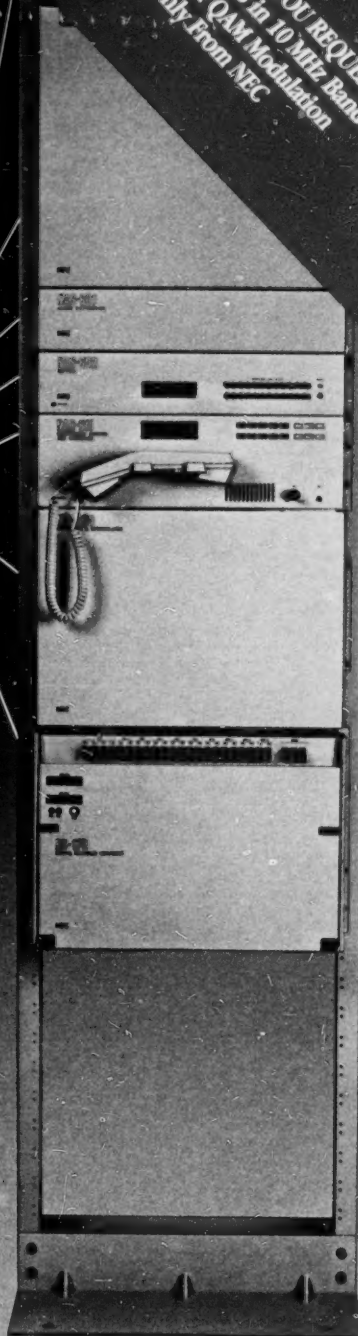
Canadian utilities spent \$6.3-billion for capital improvements in 1985, the smallest amount since 1980, when it was \$6.1-billion. According to the Canadian Electric Association, capital spending is expected to remain fairly stable now through 1993.

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Work on fiber optic system to proceed

MADISON, WI—Construction will go forward on a \$40 million fiber optics telecommunications system stretching between Chicago and Minneapolis, according to a partnership of utilities financing the project.

Norlight, a partnership of subsidiaries of five electric utilities in Wisconsin and Minnesota, hopes eventually to have a 650 mile system that will carry high-speed data and voice transmissions linking Milwaukee, Madison, LaCrosse, Eau Claire, Minneapolis, Chicago, Rockford and DeKalb.

The Wisconsin Public Service Commission recently set requirements that Norlight must meet before it can begin construction in the state. The commission said that Norlight should pay the utilities \$2.6 million for the first 203 miles of its system. That comes out to \$13,445 per mile. Initially, the venture wants to use 24 miles of Madison Gas & Electric lines and 179 miles of Wisconsin Power & Light Company lines.

Other partners are Wisconsin Public Service Corp., Dairyland Power Cooperative, and Minnesota Power & Light. The partnership plans to place its fiber optic cables into the core of the electric utilities' shield wires.

Norlight President and CEO Jim Rice said that although it disagrees with some aspects of the PSC decision, the venture will proceed.

First Utility Fault and Disturbance Analysis Conference to be held

ROCHESTER, NY—The first annual Utility Fault and Disturbance Analysis Conference for utility engineers, will be held October 30-31 in Denver, CO.

The conference is sponsored by Rochester Instruments, Inc. Topics to be covered include: Integrating transient fault data with Sequence-of-Events data; Analysis of transient faults; and Research and case histories of disturbance events.

An open forum will be held at the end of the first day to examine the various analysis philosophies and to exchange ideas.

Registration fee is \$225 before October 1, and \$250 after that date.

For more information contact Eileen Greenberg or Stephen Byers at Rochester Instrument Systems, Inc., 255 N. Union Street, Rochester, NY, 14605, or call (716) 263-7700.

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THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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DOE picks nine clean coal demonstration projects

WASHINGTON, DC—Nine projects were selected by the Department of Energy in July to receive federal funds to demonstrate "clean coal" technologies.

Sponsors of the demonstrations are American Electric Power Service Corp., Babcock & Wilcox, Coal Tech. Corp., Energy and Environmental Research Corp., Energy International, Inc., General Electric Co., Ohio Ontario Clean Fuels, Inc., The M.W. Kellogg Co., and Weirton Steel Corporation.

The projects cover a variety of market applications, including utility power generation, industrial processing, steelmaking and fuel production.

If agreements are reached between all nine and DOE, the projects will share \$360 million in federal funds while contributing almost \$600 million in total private financing.

Likelihood of success

DOE said the projects were picked from a total of 51 proposals because "they offered the greatest likelihood of successfully demonstrating and subsequently commercializing emerging clean coal technologies."

According to the agency, the first facilities to use the technologies under DOE's program could be built and in operation within several months after cooperative agreements with the government are signed. Many of the larger projects will not be ready for testing until the early 1990s, said DOE.

Congress earmarked \$400 million for the program when it was enacted in Dec. 1985.

Specific project costs will not be announced, said DOE, until actual agreements are negotiated and signed. If an agreement is not awarded to any of the applicants, additional projects will be selected from a second group of 14 proposals.



The Department of Energy recently named nine projects to receive federal money to demonstrate "clean coal" technologies. One of the projects will be demonstrated here at Ohio Edison's Edgewater Plant in Lorain, Ohio. Sponsored by Babcock & Wilcox, the two-part project will develop retrofit acid rain precursor control technologies.

Project details

Selected projects and their sponsors are:

* American Electric Power Service Corp.

AEPSC, on behalf of Ohio Power Co., will build and operate a 70 MW pressurized fluidized bed combustion combined cycle demonstration plant in Brilliant, Ohio. The project will use technology developed by ASEA-PFB. The demonstration plant will be a retrofit of a mothballed coal-fired power plant and will utilize the existing steam turbine and other site utilities.

* Babcock & Wilcox

The company is sponsoring a two-part project that will develop retrofit

acid rain precursor control technologies. The first part is an extension of a current full-scale demonstration of Limestone Injection Multistage Burner technology on a 105-MWe wall-fired utility boiler at Ohio Edison's Edgewater Station in Lorain,

Ohio. Project objectives are to demonstrate nitrogen oxide and sulfur dioxide emissions reductions on the order of 50-60 percent at a capital cost at least \$100 per kilowatt (kW) less than wet scrubbers. The second part of the project will evaluate the Conoco "Coolside" process for sulfur dioxide control. The process involves dry sorbent injection/humidification technology downstream of the boiler. The demonstration will also be done at Edgewater.

* Coal Tech Corp.

This project will be a 1,000 hour test to demonstrate the performance of an advanced, air-cooled, cyclone combustor with dry pulverized coal. Two Pennsylvania bituminous coals and one Utah sub-bituminous coal will be burned to demonstrate that the combustor is capable of burning a variety of U.S. coals in an environmentally acceptable manner. A 30 million BTU/hour (1 ton/hr) combustor is under construction in Williamsport, Pennsylvania.

* Energy and Environmental Research Corp.

The corporation intends to demonstrate a combination of gas reburning and sorbent injection for the control of SO₂ and NO_x emissions. Three sites have been selected, representing the three major firing configurations. They will be located at: Henne-

Continued on page 10

Private development of federal dam sites ahead?

WASHINGTON—If a group of dedicated public power executives have their way, funds from a private non-profit corporation soon will be used to develop new generating facilities at federal dam sites. The new corporation, a non-profit company called the Public Power Development Corp. (PPDC), has said it will sell bonds to raise \$100-million with which to finance the power development.

According to the corporation's administrative officer, Kenneth Holum, retired manager of Western Fuel As-

sociates and a former assistant secretary of the Interior for water and power, the new company will fund power projects where the federal government currently is building or already has facilities to provide water/flood control for municipal, industrial, farm and recreational uses if federal funds for power facilities are not available. PPDC funds for power development would be turned over to the federal government, which then would build the facilities.

Stanley K. Bazant, general manager of Plains Electric Generation and Transmission Cooperative in New Mexico and one of the organizers with Holum, is PPDC chairman. Other organizers include Donald R. Allen, a Washington, D.C. attorney and James L. Grahl, retired general manager of Basin Electric Cooperative. All the above are directors. Milton A. Chase, a former executive with the Rural Electrification Administration and the Cooperative Finance Corporation, also will serve as a director.

Bonds may be taxable

The company will seek to finance its projects with tax-exempt bonds, although it's financial consultant, Austin Koenen of Shearson-Lehman, has suggested it is more likely that PPDC will have to resort to taxable bonds.

Continued on page 13

Sierra Pacific plans 2,000 MW energy park in N.E. Nevada

RENO, NV—Preliminary work has begun on the environmental permitting and engineering for a 2,000 MW energy park to be operated by Sierra Pacific Resources in northeastern Nevada.

Corporate Affairs Vice President Dick Hughs told *EL&P* that his company is putting together a joint-venture consortium of non-utility partners that will plan, market and construct the project on land owned by Sierra Pacific.

Called "Thousand Springs," the park will eventually consist of eight, 250 MW coal-fired units that are essentially alike. The total cost of the project is estimated to be \$4 billion.

Hughs said power from the project will be sold wholesale to western U.S. utilities. However, he pointed out that no generating units will be built until firm contracts with utilities are signed.

Sierra Pacific hopes to begin building the units, one every two years, beginning in the mid-1990s. But, said Hughs, nothing will be constructed until all the permitting is finished and needed approvals received.

"By mid-1988," he said, "we will know where we stand."

The company has already met with several western utilities and determined that a market exists for selling the power.

Hughs noted that several legal issues still need to be addressed. Investors are attracted to the project because of its exemption from Nevada regulation. Last year the state legislature approved a bill that would exempt the plant from Nevada Public Service Commission regulation. Only the environmental permitting would have to be approved by the PSC.

He said the Federal Energy Regu-

Continued on page 9

Industry's biggest conference & show opens Sept. 14

BARRINGTON, IL—The Transmission & Distribution Conference and Exposition, sponsored by the Institute of Electrical & Electronic Engineers, will open in Anaheim, CA on September 14, running through September 18. Expected to draw 10,000 electric utility executives and engineers, engineering consultants, constructors and contractors, it is the largest event of its type in the electric utility industry.

Continued on page 14

BPA issues electric loads forecast through 2006

● The Bonneville Power Administration has issued its electric load forecast for 1986 through 2006. The low case anticipates a 0.3 percent decline per year in load growth, with a 15,100 MW load by 2006. A growth rate of 2.7 percent per year is predicted for the high case, with a load in 2006 of about 28,600 MW. The medium case results in a rate of growth of 1.2 percent per year, down from 1.3 percent as of a year ago. According to the forecast, regional loads under the medium case are expected to grow from about 16,600 MW today to about 20,600 MW by the year 2006. The medium case projects an increase in the number of people living in the Pacific Northwest from the present total of 8.4 million to 10.7 million, putting the population growth rate at 1.2 percent. This compares, said BPA, with an anticipated national growth rate of 0.8 percent.

Cafeteria at VA nuclear power station features nostalgic dining



Two refurbished locomotive dining cars serve as a cafeteria for the 600 employees at Virginia Power Co.'s North Anna Power Station. "It was less expensive than building a cafeteria and certainly is in a class by itself," said William L. Stewart, vice president-nuclear operations for Virginia Power. To add to the nostalgia, waiters dress as old-time conductors complete with gold pocket watches. "This is the most unique [cafeteria] in the county," said Station Manager Wayne Harrell, "or at least at a nuclear power station."

Canadian utilities better off without gov't interference: Norrie

● Speaking at the Canadian Electrical Association's annual meeting, Winnipeg Mayor William Norrie said that Canadian utilities are best run with a minimum of government interference. "I think there's a real danger in the politization of our electric utilities and that seems to me to be going against the best interest of the utilities," Norrie feels that utilities should be run by those who know the industry best, and that while the experience of having them operate in a mixed economy has been favorable, that is changing. "We've been very fortunate at the City of Winnipeg. We've had a very efficiently run, well organized department. I think that is probably because the politicians of the City seem to keep their hands off the hydroelectric system," said Norrie.

In This Issue

Editorial	4
Industry leaders highlight transmission and distribution progress.T/D ..	16
Calendar	23
Special Bulletin Board section of exhibitors at the 10th Transmission & Distribution Conference and Exposition.T/D	38
Readers' Service	45
New Products	47
Bulletin Board	57
Personnel	63
Regulatory Review	64
Management Methods	65

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

Insurance pools refund \$4 million to nuclear plant operators

● As part of the Industry Credit Rating Plan, two nuclear insurance pools, American Nuclear Insurers (ANI) and Mutual Atomic Energy Liability Underwriters, have refunded a total of more than \$4.2 million in insurance premiums to nuclear power plant operators, according to the Insurance Information Institute. ANI President Burt C. Proom said that under the plan, about 70 percent of each year's liability insurance premium is placed in a reserve fund, which is only used to pay claims and claim expenses. According to Proom, the unused portion of the reserve fund is refunded to the policyholder after a ten-year period.

Construction audit conducted on Braidwood I nuclear unit

● The Illinois Commerce Commission (ICC) said that O'Brien-Kreitzberg, Inc. has been chosen to conduct a construction audit of Commonwealth Edison's Braidwood I nuclear unit. The construction management company will work in conjunction with engineering advisors and the accounting firm of Ernst & Whinney. The ICC said that the first phase of the audit, which will cost Commonwealth Edison about \$1.7 million, is expected to be finished by the end of March. The second phase, according to the ICC, should be done by next July or when construction of the unit is completed. Braidwood I is scheduled to begin power production in mid-1987.

NRC issues operating license to PSE&G's Hope Creek station

● Public Service Electric and Gas Co. said its Hope Creek generating station has been issued a full power operating license by the Nuclear Regulatory Commission. The utility expects to place Hope Creek in commercial operation by the end of the year. PSE&G has a 95 percent interest in the 1067-MW boiling water reactor, while Atlantic Electric Co. holds the other five percent.

Con Edison electric bills drop 15 percent in two years

● According to Consolidated Edison, the electric bills of its typical residential customers have dropped about 15 percent over the past two years. The utility cited lower costs for fuel oil and natural gas as the main reason for the decrease. The average New York City customer using 250 kWh monthly, has a \$38.59 electric bill, all taxes included. This bill, said Edison, is 7.8 percent less than the \$41.87 charged in July 1985 and 15.3 percent less than the level two years ago.

PSC cuts WP&L revenues by almost \$5 million

● The Wisconsin Public Service Commission said it has given preliminary approval of a \$5 million revenue reduction for Wisconsin Power & Light Co. (WP&L). The utility had originally requested a \$14.4 million increase for its electric, natural gas and water customers. A slight increase of about \$700,000 was given for WP&L's natural gas and water rates, according to the PSC. The commission said that a major factor in the reduction was its decision to lower the allowed return on common stock equity from 14.5 percent to 13.5 percent, due to lower interest rates.

NRC grants VA Power license for dry cask storage

● Virginia Power said it is the first U.S. utility to be issued a license by the Nuclear Regulatory Commission to store spent nuclear fuel above ground in dry storage casks. The company will store the fuel at its Surry power station and said this means it will not have to ship spent fuel assemblies from Surry to the North Anna Power station following a scheduled refueling in October.

Monticello plant celebrates 15 years of commercial operation



Northern States Power Co. officials accept plaques commemorating 15 years of commercial operation for NSP's Monticello nuclear plant in MN. The 557-MW boiling water reactor has maintained a 72 percent capacity factor while generating 50 billion kW over 15 years, according to the utility. Accepting the plaques are: Charles Larson, vice president-nuclear generation, Dennis Gilberts, senior vice president-power supply and Wayne Shamba, plant manager.

Multi-billion power plant pipeline emptying fast: UDI

WASHINGTON, D.C.—New plant additions will begin to fall off dramatically beginning in 1988, says the Utility Data Institute.

The not-for-profit information services organization says in a new report that the multi-billion construction pipeline for power plants is rapidly emptying.

In 1988, the report states that the average 20,000 MW per year installation level of new central station plants seen over the last 15 years will drop to 5,000 MW or less through 1996 and beyond.

"We probably have fewer power plants under construction today than at any time in the last 15-20 years," said UDI President Liz Hannon. "Given the fact that it currently takes 5 to 10 years to license and build a new coal or nuclear plant, construction of any additional capacity needed for service in the 90's would need to start soon."

Latest data

Entitled *Capital Costs of Projected Power Plants*, the report provides the latest cost and schedule data for about 275 coal, nuclear and other power plants representing 125,000 MW of new capacity through 2010 and a total capital investment exceeding \$100 billion.

According to the report, the cost per kilowatt of new installed capacity ranges from \$750-\$2,000 per kW for

new coal units and \$1,700-\$5,500 per net kW for new nuclear units, over the next 10 years.

Between 1986 and 1996, the report states, only 51,000 MWe of new capacity is actually under construction with most of that scheduled to come on-line in 1986 and 1987. An additional 21,000 MW of capacity is planned but not yet under construction.

The report found that about two-thirds (62%) of the capacity under construction is represented by 27 large nuclear plants. New coal-fired capacity under construction represents an additional 34% (24 plants); a combination of 24 gas turbines, combined cycle units, hydroelectric plants and geothermal plants combine to provide the remaining four percent.

Clear trend

Only three coal-fired central station generating plants have been ordered in the last three and one-half years, said UDI. The clear trend has been downsizing, deferral and cancellation of plants that are already in the pipeline, states the report.

UDI's data comes from twice yearly surveys of the electric utility industry, press releases and annual reports.

Copies of the study are available for \$150 per copy. For more information, call the Utility Data Institute at (202) 466-3660.

Nuclear accident could cost \$15 billion in damages, says GAO

WASHINGTON, D.C.—A catastrophic accident at any of the nation's 117 commercial nuclear reactors could cost between \$300 million and \$15 billion in off-site and liability damages, according to a report from the General Accounting Office.

If weather conditions were bad at the time of the accident, GAO said the cost could increase by ten times.

A catastrophic accident at a utility near a major city, such as the Indian Point plant near New York, could cause as much as \$15 billion in off-site damages.

Sen. George Mitchell (D-ME), who requested the study, is a member of the Environment and Public Works Committee which is drafting nuclear liability legislation. He said the figures are evidence that Congress should significantly improve existing nuclear liability laws.

Essential

"It is essential that we put in place a system for assuring potential victims that their losses will be covered and that nuclear utilities are held accountable for their actions," said Mitchell in a press conference.

Congress is considering legislation to reauthorize the Price-Anderson Act. Currently, nuclear utilities are liable up to \$665 million in case of an accident. The Senate Energy Committee has reported a bill (S. 1225) limiting liability to \$2.5 billion. In the House, the Interior Committee's bill (H.R. 3653) would place a limit on liability of \$6.5 billion.

GAO estimates that the House version would cover 95 percent of the reactors, while the Senate's bill would cover 64 percent of the utilities.

Said Mitchell, "I have several concerns about these limits on liability in light of the GAO estimates. First, none of the bills or the current law provides for full compensation for victims of a nuclear accident. If we

are to continue to use nuclear power, victims must be assured that they will not be the ones to pay for an accident."

According to GAO, a catastrophic accident would involve extensive core damage, failure of all safety features, and a massive, early breach of the containment. A severe accident would be the same, said the agency, except some safety systems would work and the containment breach would not be immediate. The probability of a catastrophic accident is estimated to one-half that of a severe accident.

Accident probability

At any particular plant, GAO said the estimated probability that a catastrophic accident will occur in a single year is one in 100,000.

If a severe accident were to occur, the report says average costs would range from \$5 million to \$220 million.

"Chernobyl amply demonstrates the folly of not planning ahead," stated Mitchell. "We know in advance there are risks and we are obliged to do all we can to minimize the burden on potential victims."

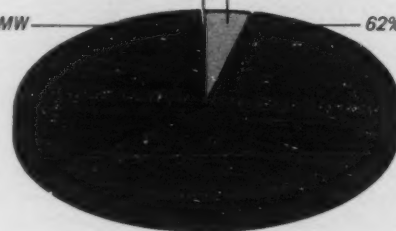
Approximately \$41 million has been paid in an out-of-court settlement for claims from the Three Mile Island accident in 1979. That was the first test of the Price-Anderson Act. GAO said \$14 million went for anticipated indirect health effects; \$5 million to monitor the health of residents within 15 miles of the unit; and \$22 million for economic losses suffered by individuals. Since this settlement, 2,000 additional personal injury claims have been filed.

Final report

GAO's report, *Nuclear Regulation—Financial Consequences of a Nuclear Power Plant Accident*, is preliminary. Mitchell said a final report will be released later this year.

CAPACITY BY FUEL OF
U.S. PLANTS UNDER CONSTRUCTION
1986-1996

0% int. combined cycle—21 MW
0% geothermal—132 MW
34% coal—17,119 MW
4% hydro—1983 MW
62% nuclear—31,792 MW



Source: "Capital Costs of Projected Power Plants," Utility Data Institute, June 1986.

According to a report from the Utility Data Institute, new plant additions will begin to drop dramatically starting in 1988. The report says that construction of capacity for the 1990's will need to start soon.

EL&P's traveling trade show to tour eastern utilities in 1987

BARRINGTON, IL—The EL&P Caravan, *Electric Light & Power's* traveling trade show, will visit eastern utilities in the Spring of 1987. The Caravan, made up of two tractor-trailer units, will feature the product exhibits of over two-dozen suppliers to the electric utility industry.

The tour will run five- to six-weeks in length through May and June of 1987. This will be EL&P's fourth Caravan tour.

The Caravan will tour from Maine to Florida and as far west as the eastern parts of Tennessee and Kentucky. Stops will be scheduled at all major investor-owned electric utilities. Large cooperatives, municipal and other public power organizations, and consulting engineering firms also will be included.

EL&P publisher Duke Kiesel announced the new Caravan program, pointing out that the idea of taking the trade show to the viewers is a con-

tinuation of EL&P's long record of service to the electric utility industry. "The idea was novel when EL&P launched its first Caravan in 1970, and it's just as useful and economic to utilities today. Nobody else makes it so easy for utility engineers and operating personnel to learn first-hand about state-of-the-art equipment without major expenditures of time and money."

Each supplier exhibit will be staffed with a representative of the supplier to provide technical information. Product and application literature also will be available.

The EL&P Caravan is co-sponsored by Mobile Marketing Services, Inc., Ft. Lauderdale, FL, which will provide additional information upon request. The phone number is (305) 565-9448 or 9449.

The complete schedule of stops will be published in *Electric Light & Power* early in 1987.

UtiliCorp forms new company to make generating investments

KANSAS CITY—UtiliCorp United formed a subsidiary in July that will enable it to make investments in generating units outside its basic operations.

Also, the company announced that it plans to change its state of incorporation and increase its authorized common shares.

UtiliCorp said its new wholly-owned subsidiary, Energy Investments Inc., will make investments in other utility properties.

"This action enables UtiliCorp to participate in non-operational investments and investment partnerships in base-load generating units outside our basic operations. It further enhances our strategic plan to grow within the regulated utility industry via interstate and intrastate operations," said Richard S. Green, Jr., UtiliCorp CEO and President.

Missouri Public Service, Peoples Natural Gas and Kansas Public Service are divisions of the company. Pending regulatory approval, West Virginia Power will become a fourth division. UtiliCorp also has signed a letter of intent to purchase the Minnesota gas distribution operations of the Inter-City Gas Corporation.

UtiliCorp will ask its shareholders at a special meeting in October to approve a reincorporation of the compa-

ny in Delaware. It is now incorporated in Missouri.

The company also will ask shareholders to approve an increase in the number of shares of common stock from 15 million to 50 million shares.

Said Green, "The increase in the number of shares will facilitate future financing, acquisitions, stock splits and stock dividends."

Did You Hear...

"Wall Street investment bankers are giving talks these days about utility takeovers and consolidations. A few years ago, the 'pop' topic at similar seminars was utility bankruptcy. We haven't seen any of those, and it is likely we won't see a wave of the others. What happened with Cleveland Electric Illuminating and Toledo Edison may be a trendy topic but not a trend. Preoccupation with 'shark repellent' to block hostile takeovers appears to be mainly a management conceit."

—Larry Hobart, executive director of the American Public Power Association, speaking before the American Bar Association on Aug. 12, 1986.

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

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Tornado slams IPS's Neal 4 generating station: rebuilding and repair could take up to a year

SIOUX CITY, IA—It could take Iowa Public Service up to a year to get the Neal 4 generating station back on line following a tornado that smashed into the plant at the end of July. Damages were estimated to total as much as \$50-million.

Neal 4 is owned jointly by 14 investor-owned utilities, rural electric co-operatives and municipalities in Iowa and South Dakota. Iowa Public Service owns 40.57 percent, the largest single share, and operates the unit. It is the largest generating unit on the IPS system and in 1985 experienced the best operating year in its seven-year life.

Extensive damage

According to company president Russ Christiansen, the storm was "the most destructive thing I've ever seen."

The plant sustained serious damage as winds tore off roof sections over the turbine building and control room. The coal handling system was totally demolished. The Central Storeroom building was destroyed and some \$6-million worth of parts had to be sifted from the remains, identified and tagged for use again. The Neal substation was damaged and a connecting 161-kV transmission line lost 18 structures.

No serious injuries or deaths

Fortunately, none of the eight workers in the plant were hurt when the storm hit. The only casualty was a Wells Fargo security guard who sought shelter in the guardhouse and suffered a slight cut on the head.

Cleanup activities began as soon as the storm passed the plant. One of the

Continued on page 6

Nuclear industry leaders call for self-improvement, changes

BARRINGTON, IL—A group of nuclear industry leaders has issued a report calling for the U.S. nuclear utility industry to take the initiative in improving its performance record and public image.

The Utility Nuclear Power Oversight Committee (UNPOC), which is made up of past and present utility nuclear executives and other industry experts, says its self-examination represents a major effort aimed at further improving the safe and reliable operation of nuclear units in the U.S.

Absolutely essential

"Quality operational performance of all U.S. nuclear utilities is absolutely essential for public and regulatory trust," states the report.

Conducted by a task committee of UNPOC, the report addresses three main questions. The committee looked into: 1.) how nuclear plant operating performance can be improved; 2.) how the industry's relationship with the Nuclear Regulatory Commission can be improved; and, 3.) establishing a unified nuclear utility industry group.

Members of the UNPOC committee included Chairman Lelan F. Sillin, Jr., former chairman and CEO of Northeast Utilities; Vice Admiral Eugene P. Wilkinson USN (ret.), for-

mer president and CEO of the Institute of Nuclear Power Operations (INPO); and, Marcus A. Rowden, former chairman of the NRC. In conducting research for the report, they met with utility CEOs, regulatory commissioners and staff, and various industry groups.

The report, *Leadership in Achieving Operational Excellence: The Challenge For All Nuclear Utilities*, points out that as of July 1, 101 nuclear plants were licensed for operation and an additional 21 are under construction.

According to the committee, "...industrywide exemplary performance is the single most important factor if the nuclear utility industry is to achieve and maintain public and regulatory confidence and trust. Further, such performance is essential if the utility industry is to gain the credibility necessary for greater reliance to be placed on industry self-improvement initiatives."

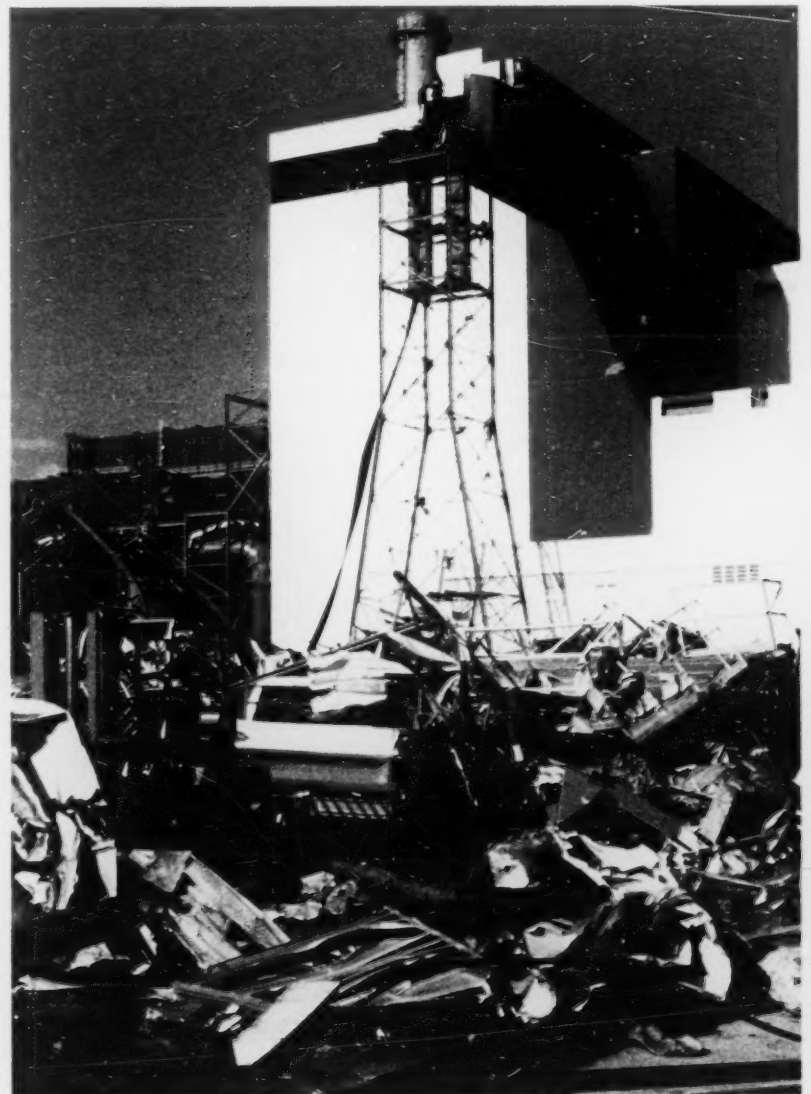
NRC support

NRC Chairman Lando W. Zech, Jr. said he strongly supports the industry initiative. "I believe that this nuclear utility industry commitment for self-improvement is a most commendable effort, and in my judgment," he remarked, "one of the most important initiatives the industry has ever undertaken."

As to improving the operational performance of the plants, the committee said there are two areas where the industry and INPO are being challenged.

The committee said that the overall performance record of the U.S. nuclear industry has not compared favorably to performance of similar plants being operated in Germany, France,

Continued on page 11



Tornado that ripped into Iowa Public Service Company's Neal station destroyed the coal handling system, damaged a substation and left the area strewn with rubble. Roof sections were blown off several parts of the plant, including the control room, causing interior damage also.

Virginia Power dedicates first U.S. aboveground waste storage facility

SURRY, VA—Officials from the U.S. Dept. of Energy and Virginia Power dedicated Aug. 26 the first aboveground facility in the U.S. licensed to store high-level spent nuclear fuel.

The facility is located at Virginia Power's Surry power station. Utility Chairman William W. Barry and DOE's Director of the Office of Civilian Radioactive Waste Management Ben C. Rusche presided over the ceremonies.

First to need more storage

"We're the first utility to need more on-site storage," noted Barry, "but about half the utilities in the country will also need additional

space before permanent storage is available."

DOE's Rusche said in his prepared remarks, "The significance to the nation of today's dedication of this facility is that spent fuel from commercial power reactors can be stored at reactor sites in a safe, economical and environmentally acceptable manner both in pools and in dry casks. This new step adds confidence that nuclear utilities will be able to continue to operate while the siting, design, construction and operation of the integrated waste disposal system for long-term, permanent disposal is being developed."

Virginia Power said the dry storage
Continued on page 12

**Read about 1986's
Utility of the Year
in the Nov. EL&P**

NY Power Authority to finance study of prehistoric fossils

● According to the New York Power Authority, rock extracted during construction of its Blenheim-Gilboa Pumped Storage Project has provided scientists with 380 million year-old fossils of plant and animal life. The Power Authority said it is contributing \$125,000 for a team of biologists and geologists to study the fossil-bearing rocks. "Besides looking at the remains of specific plants and animals, we'll be using the fossils and sedimentary rocks to determine what the entire ecosystem was like," said Dr. Patricia Bonamo, professor of biological sciences at SUNY-Binghamton and head of the research team.

KG&E's Wolf Creek sets first year power production record



According to the Atomic Industrial Forum, Inc. (AIF), Kansas Gas & Electric Co.'s Wolf Creek nuclear generating station set a new U.S. record for first-year commercial power production when it passed the 8.699 billion MWh mark, surpassing the record set in May by Pacific Gas and Electric Co.'s Diablo Canyon Unit 1. AIF said other first-year record performers included Union Electric Co.'s Callaway, which generated 8.475 billion MWh, and Public Service Electric and Gas Co.'s Salem 2, which produced 8.380 billion MWh.

DOE completes Mod-2 wind turbine research program

● Experimental operation and research on three, 2500-kW wind turbines has been successfully completed, according to the Department of Energy (DOE). DOE said the Mod-2 turbines combine a failsafe shutdown protection system, a soft (less rigid) steel tower and a rotor with acceptable noise levels. Boeing Aerospace Co. designed, built and installed the machines under a program managed first by the National Aeronautical and Space Administration and now by the Solar Energy Research Institute. DOE expects sale of the turbines to take place in early 1987. "In the meantime," said Assistant Secretary for Conservation and Renewable Energy Donna R. Fitzpatrick, "the machines will continue to be operated on a reduced schedule for the remainder of the year."

In This Issue

Editorial	4
Calendar	9
Targeted chlorination offers improved control of condenser biofouling. G	15
Field calibration for coupling capacitor voltage transformers verifies their accuracy for EHV metering purposes. T/D	17
New Products	23
New Literature	26
Readers' Service	27
Management Methods	32
Regulatory Review	33
Personnel	34

EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (*) in the upper right corner of page 1; the T/D edition carries two dots (**). All readers receive EL&P's industry news section.

New Hampshire Yankee asks NRC for zero-power license

● New Hampshire Yankee said it has asked the U.S. Nuclear Regulatory Commission for permission to load Seabrook Station's reactor with fuel and to conduct a month-long series of tests without starting up the reactor. According to the company, construction of the plant is complete and ready for low-power testing of the reactor, however a recent decision by the NRC's Atomic Safety and Licensing Board to re-open some 1983 hearings has delayed the issuance of a low-power license. George S. Thomas, New Hampshire Yankee vice president for nuclear production, said "We want to use the time during this delay to perform a series of 'zero-power' tests...[which] would be conducted prior to starting up the reactor anyway..." Thomas stressed that this would shorten the schedule for low-power testing by about 35 days. He added, "...every day this project is delayed [it] costs more than \$1 million. We have an obligation to prevent delays, and conducting these tests now will do that effectively and safely."

B&W to supply project with two mass-burning refuse boilers

● Babcock & Wilcox (B&W) has received a \$20-million contract to supply a refuse-to-energy system, including two mass-burning refuse boilers, for a waste-to-energy power project in Austin, TX. The company said each unit is designed to burn 432 tons of unprocessed refuse per day and that the only necessary fuel preparation involves removal of large, non-combustible items. According to B&W, steam from the two boilers will generate 20 MW of electricity for the city. The company expects commercial operation of the facility to begin early in 1989.

Rossin sworn in as Nuclear Energy Assistant Secretary

● According to the U.S. Department of Energy, Dr. A. David Rossin has been sworn in as assistant secretary for Nuclear Energy. Rossin's April 18 nomination by President Reagan was confirmed by the Senate in mid-August. In his new position, Rossin will serve as principal nuclear energy policy advisor to the Secretary of Energy and as a key administration spokesman on the issue. For the last four and a half years, Rossin directed the Nuclear Safety Analysis Center at the Electric Power Research Institute in Palo Alto, CA.

C-E receives \$23 million hydro contract

● Combustion Engineering, Inc. (C-E) said it has been awarded a \$23 million contract to provide a turnkey hydroelectric generating plant for Miller Hydro Group's Worumbo Project in Lisbon Falls, ME. Under the contract, C-E will supply the design, equipment, construction, project management and start-up for the 14.8 MW plant. Operation and maintenance service will be provided by the company under a separate contract, according to C-E.

PSC refuses to rehear PNM's holding company request

● The New Mexico Public Service Commission (PSC) said it denied Public Service Co. of New Mexico's (PNM) request to rehear its proposal to reorganize as a holding company. The commission rejected the holding company proposal in July and in August the company asked the commission to rehear the proposal. The PSC, however, stated that PNM "...may develop new restructuring proposals in the future...[which]...provide PNM with additional flexibility for its diversification activities without impairing the commission's ability to carry out its statutory mandates." PNM Senior Vice President and Chief Financial Officer A.J. Robison said in response, "PNM will continue its holding company efforts because of the commission's statements and because the holding company structure offers substantial benefits to shareholders, customers and New Mexico's economic development."

Green Mountain Power's \$1 million rate reduction approved

● Green Mountain Power Corp. (GMP) said that its request for a \$1 million rate reduction has been approved by the Vermont Public Service Board. According to President and Chief Executive Officer John V. Cleary, Jr., the utility has reached a settlement with the Department of Public Service to withdraw a pending 6.7 percent (or \$6.3 million) rate increase, as well as to reduce the existing rates. "This is the first time since the 1960's that GMP has asked to reduce basic rates," stated Cleary, "We are able to seek the rate reduction because of favorable power sales we have made to other New England utilities and because our other operating costs, principally power supply expenses, have gone down."

California PUC lowers PG&E's rates again

● The California Public Utilities Commission said it further reduced Pacific Gas and Electric Co.'s (PG&E) electric rates by \$343.1 million, bringing the utility's total amount of decreases to \$703 million. In June, the commission granted PG&E an interim rate reduction of \$360 million. The utility had originally requested an \$887 million rate reduction.

AP&L anticipates tax law changes, asks for rate cut

● Arkansas Power & Light Co. said it is requesting a rate reduction from the Arkansas Public Service Commission to reflect the expected corporate income tax law changes now under consideration by Congress. "By recognizing these benefits now," stated AP&L President Jerry L. Maulden, "we can reduce our present rates \$15 million and also offset a planned \$45 million increase related to Grand Gulf...a total customer benefit of \$60 million." It is anticipated that the new tax law, which will become effective next year, will lower corporate income tax rates from the present 46% level, according to the utility. "We wanted our customers to get the benefit now," said Maulden.

Electric supply shortfall possible, says Harvard study

CAMBRIDGE, MA—If electricity growth holds steady at a 3.5 percent annual rate through 1993, a group of Harvard researchers believes the nation could experience a supply shortfall of 70 GW by 1993.

Joseph P. Kalt, Henry Lee, and James T. Hamilton of Harvard's Kennedy School of Government reviewed assumptions and conclusions from previous studies of electric supply adequacy.

"At a national level," they said in the report, "there is reasonable cause for concern about the ability of the power industry to satisfy electricity demand in the 1990s without incurring shortages, price increases above and beyond those predicted, or other severe measures to limit demand."

The Harvard researchers examined the National Electric Reliability Council's nine regions and projected the adequacy of capacity for each under four different scenarios. (See table.)

High reserve margins and low reserve margins were used with forecasts from NERC and the Department of Energy.

In the high reserve margin case, discretionary capacity is assumed to be built. In the low reserve margin scenario, discretionary capacity is abandoned. The authors define discretionary capacity as coal plants which are planned but not built and nuclear units which are less than one-third completed.

To guarantee margins

"Most regions of the country will have to begin bringing discretionary capacity on-line during the next four years in order to guarantee adequate reserve margins during the early 1990s," concluded the report.

Using a reserve margin of 20 percent as a point for determining adequacy, the authors said Texas, California, southern Nevada and the Upper Midwest face the possibility of sharp price increases or shortages even under conditions of low demand growth and optimistic capacity expansion.

If capacity not added

If the extra capacity is not added,

the report says those areas will be joined by Louisiana, Arkansas, Oklahoma, Kansas, western Missouri, and western Mississippi as states with severe capacity problems.

The study found that the Pacific Northwest has a significant supply of electricity and the Northeast's situation is "manageable."

New central station capacity will not have to be the only solution to a supply shortage, according to the report.

"Power plant conversion and refurbishment, improved and expanded interregional transmission, imported power, and decentralized power production (such as cogeneration), can make a substantial contribution to avoiding any shortfall," noted the authors. "DOE finds that there is a realistic potential that these sources will

account for 60 GW of power by the year 2000."

Even with a high growth-low construction scenario, the study said blackouts and brownouts would not necessarily be the result. The Harvard researchers suggested that electric prices might be increased to dampen demand.

Looking beyond the 1990s, the study says the usefulness of forecasts declines because of increasing uncertainty.

For the longer term, the report says the relevant question is: "Will economic and regulatory conditions permit required investments in electric generating capacity to be made—on time and at the lowest feasible cost?"

The authors made several policy
Continued on page 13

SUMMARY OF REGIONAL RESERVE MARGINS: 1993

Region	NERC Demand		DOE Demand	
	High R.M.	Low R.M.	High R.M.	Low R.M.
ECAR (OH, KY, WV, IN, w. PA, w. VA, w. MD, MI)	31.6%	31.2%	13.0%	12.7%
ERCOT (TX)	17.1	4.1	8.0	-4.0
MAAC (NJ, e. PA, e. MD, DE)	30.7	26.1	19.7	15.5
MAIN (IL, e. MO, e. WI, n. MI)	24.4	24.4	10.6	10.6
MAPP (MN, IA, ND, SD, NE, e. MN, w. WI)	16.6	7.7	7.3	-0.8
NPCC (NY, New England)	30.9	28.3	15.2	12.9
SERC (NC, e. MS, SC, AL, GA, TN, e. VA)	25.0	21.6	6.4	3.5
SPP (LA, w. MS, AR, OK, w. MO, KS)	22.0	12.3	10.8	2.1
WSCC-NW (WA, OR, w. WY, w. MT, ID, n. NV)	69.7	68.4	55.9	54.6
WSCC-Mts. (UT, CO, e. WY)	41.9	28.7	13.5	2.9
WSCC-SW (NM, AZ)	38.9	34.1	10.1	6.3
WSCC (CA, s. NV)	11.6	8.3	1.1	-1.9

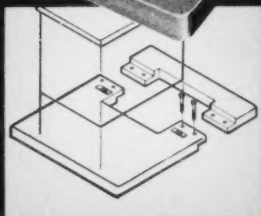
R.M. = Reserve Margin.

High R.M. = Reserve Margin with construction of discretionary capacity.

Low R.M. = Reserve Margin without construction of discretionary capacity.

Source: "A Review of the Adequacy of Electric Power Generating Capacity in the U.S.," Kalt, Lee & Hamilton.

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Inquire R.S. 2

Editorial

U.S. utilities need U.S.-made equipment

Could the U.S. electric utility industry be on the verge of losing control of its own future? Could the nature and pace of technological development be dictated by outsiders? What absurd ideas! Or are they?

Ten years ago, only a handful of offshore apparatus manufacturers plied their wares among American utilities. The fragile nature of international dependence had been made abundantly clear by the Arab oil embargo. Most U.S. utilities had little desire to be dependent on offshore sources for essential equipment or services.

But times changed, and memories faded. Offshore suppliers, lured by the potential of the world's largest national market for heavy electrical equipment, found U.S. utilities less adamant about reliance on domestic suppliers only. Major offshore manufacturers, such as ASEA, Brown Boveri, Siemens, and Toshiba, to name only four, sought affiliations with existing domestic suppliers, to ease their entrance into the American market or to enhance their presence.

Still, as recently as 1984, only a handful of non-domestic manufacturers of electrical equipment and apparatus exhibited at the IEEE T&D Exposition. But by the next T&D Conference and Exposition, held last month, foreign exhibitors numbered in the dozens. Still, U.S. utilities are calling the shots as to what they will or will not install on their future systems.

But there has been a fundamental change in the way equipment and apparatus is purchased. Only a few years ago product quality, reserve operating capacities, safety margins, and long life expectancy were prime criteria. Now, primary emphasis has shifted again to bottom line price. The effect of this change in emphasis could have a long term impact on the reliable operation of U.S. power systems for years to come.

A major concern among many manufacturers of T&D equipment at the IEEE Show was the possible effects of this shift away from buying quality and what it will mean. Even executives of U.S. subsidiaries of offshore companies, who manufacture in the U.S., see dangers resulting from the shift to greater price buying.

Over time, they suggest, emphasis on price favors either manufacturers with cheap labor supplies, or those companies who are able to invest large amounts of money to upgrade manufacturing facilities to be more productive. As price competition increases, profitability declines, and reinvestment in plant becomes more difficult or impossible. And since the U.S. is a high-cost labor market, this works against domestic manufacturers. The result can be the shift of manufacturing to offshore sources and the loss of hundreds of thousands of U.S. jobs. U.S. facilities could be used for assembly and test only, as has already happened in the power circuit breaker field.

The electric utility industry, which over the years has worked closely with its domestic equipment manufacturing allies, could find itself far removed from its sources of product development. With such a loss the entire nation could find its industrial base at risk.

To be perfectly clear, we are not against the participation of offshore suppliers in the U.S. market. We welcome the imagination and creativity they bring to the solution of electric utility problems in this country. But we must strongly support domestic production by those offshore suppliers.

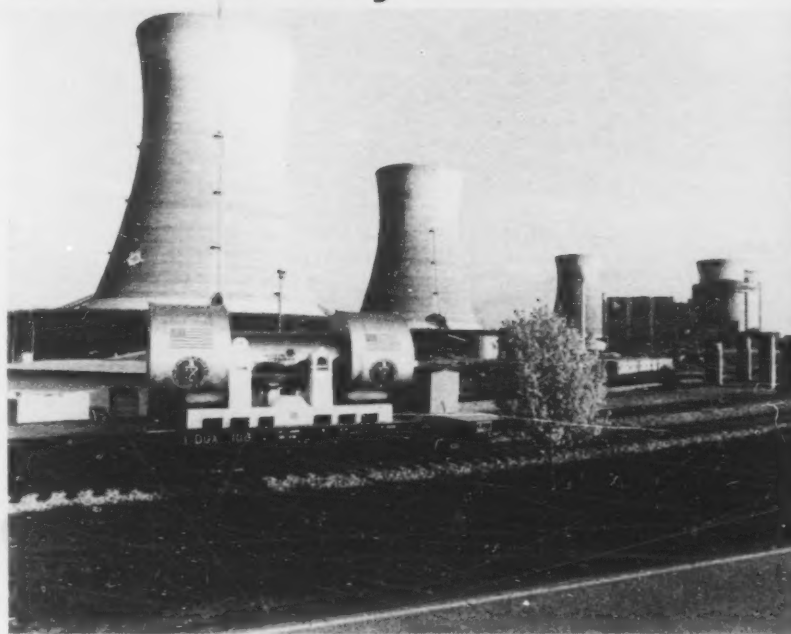
Utilities must, therefore, return to making purchasing decisions based more on the quality of the equipment at fair and reasonable prices, not always pushing for the lowest price. Our electric power supply is too essential to the economy and to the strength of the nation to ever allow it to become dependent on non-domestic sources for the equipment necessary to its production. But this is exactly what can happen if utility buyers continue to put their major emphasis on lowest prices.

We all smiled at that funny little German car that was introduced in the United States in the 1950s; after all, who would buy a foreign automobile? And we recall the hoots of derision when the suggestion was made that the United States was losing its basic steel industry. Now, we are all aware of how serious offshore suppliers are and how competent they can be at meeting market needs.

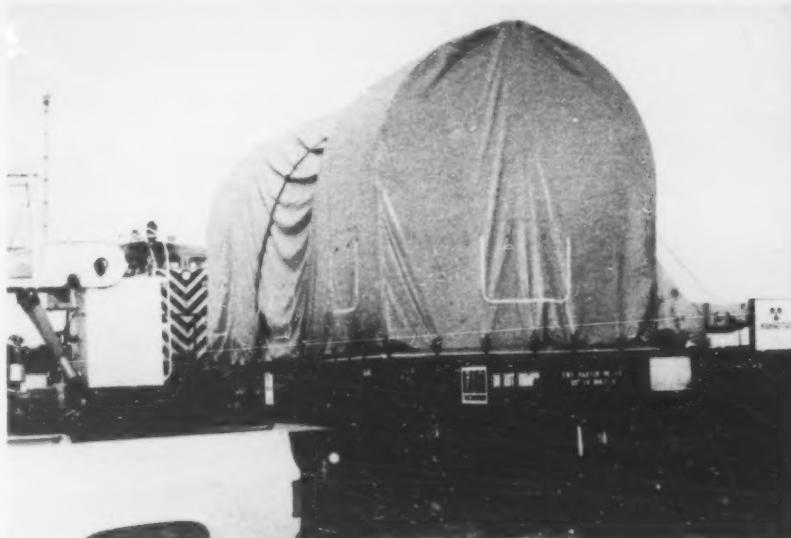
Will we see increasing shifts to equipment manufactured offshore? It all depends on what utility buyers are willing to do in the next five to ten years. And that time begins now.

Robert A. Lincicome, Editor-in-Chief

First of TMI-2 debris arrives safely in Idaho



Approximately 2,000 lbs. of radioactive debris from the Three Mile Island Unit 2 reactor leaves Pennsylvania in mid-July (R.) headed for the Idaho National Engineering Laboratory.



Lab spokesman Terry Smith said it took about one week for the shipment to arrive in Idaho. The debris is being shipped in two lead and steel casks that are 23 ft long and 10 ft in diameter. Smith said future shipments will average 10,000 lbs. of debris. He estimates that 35 to 40 more loads will be carried to Idaho over the next two and a half years by Conrail and Union Pacific Railroad. Each cask holds specially-designed defueling canisters that are 12 ft long, 14 inches in diameter and hold as much as 1,500 lbs. of debris.

August 1986 Top 100 story correction

In our August 1986 "Top 100 Operating Performance" story (p.17) it was incorrectly reported that Orange & Rockland's gas consumption declined in 1985. The company's consumption of natural gas increased in 1985 by 28

percent compared to 1984.

Interstate Power Company's circuit miles of transmission line below 189-kV should have been reported as 2,568 miles, a 36 mile reduction over the previous year.

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Mountaineer coal-fired plant breaking records for continuous run

NEW HAVEN, WV—Appalachian Power Company's 1,300 MW Mountaineer coal plant is headed toward another world record for continuous operation of a steam electric generating unit.

On July 14 the plant completed 365 consecutive days of continuous operation and has been running ever since.

Breaking the mark

At press time in mid-September, the plant was setting a new record every day and was headed toward breaking the mark for a large-sized steam electric unit. That record of 439 days is held by Duke Power Company's Oconee Unit 2 nuclear plant. An AEP spokesman said that the

Mountaineer plant will have run 440 consecutive days on Sept. 27.

Previously, the record for continuous operation by a major coal-fired station was set last March by Monongahela Power Company's Harrison plant, which operated for 346 days.

Appalachian Power is one of eight operating companies in the seven-state American Electric Power system.

Only seven similar units

The Mountaineer unit is one of five 1,300 MW units operated by AEP. Only seven 1,300 MW fossil units are in service in the world, all of which use boilers manufactured by Babcock & Wilcox Company.

Since commercial operation in 1980, Mountaineer has had an average unit availability of more than 90

percent, including 97 percent in 1981, 97.6 percent in 1984, and 100 percent to date in 1986.

DOE's Hesse named chairwoman of the Federal Energy Regulatory Commission

WASHINGTON—President Reagan recently announced the nomination of Martha A. Hesse to chairwoman of the Federal Energy Regulatory Commission.

Awaiting confirmation

She replaces former chairman Raymond J. O'Connor, who left before completing his term. Her

term expires Oct. 20, 1987. Hesse was awaiting Senate confirmation at press time.



Martha O. Hesse

Hesse has been the Department of Energy's Assistant Secretary for Management and Administration. In her position she has direct or oversight responsibilities for \$22 billion a year and 135,000 government or contractor employees.

Background

Before joining DOE in Dec. 1982, Hesse was Executive Director of the President's Task Force on Management Reform. Previously she served as Associate Deputy Secretary of Commerce.

Hesse attended the University of Iowa, majoring in psychology, and received an MBA (The Executive Program) from the University of Chicago in 1979.

Electric supply ... from page 3

recommendations in their report:

1. Investor rates of return should not be held below the cost of capital.
2. Investors should not be guaranteed that they will never lose money on their capacity decisions. Rather, investments should be governed by standards of "used and useful."
3. Utility commissions should avoid technological bias arising from pre-judgments about the feasibility of particular generation technologies.
4. Electricity should be wheeled and transported at every opportunity to insure that capacity is fully used and allocated to its highest valued uses.
5. Regulatory impediments that protect monopolistic practices in power transportation should be eliminated.
6. Obstacles and penalties to third-party electricity sales should be removed.

For copies

Copies of *A Review of the Adequacy of Electric Power Generating Capacity in the U.S., 1985-93 and 1993-Beyond* can be obtained by contacting the Energy & Environmental Policy Center at the John F. Kennedy School of Government, (617) 495-1357.

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Inquire R.S. 7

Wind power now an option for utilities, says EPRI

PALO ALTO, CA—Smaller wind power turbines have advanced enough that electric utilities should begin looking at them as a generating option now and in the future, according to the Electric Power Research Institute.

In a recent *Technical Brief* update on wind power, EPRI said, "Small wind turbine technology has progressed to the point where the utility industry can factor wind power into its long-range generation expansion plans and take early steps to prepare for use of wind power."

By the end of 1985, more than 13,000 machines had been installed in California. (See chart) EPRI said advantages of the smaller turbines include design simplicity, ease of installation and repair, and rapid reliability maturation.

The aggregate rating of the installed turbines is estimated to be 1.1 GW. EPRI said the availability of individual units in the leading commercial wind stations has trended to 0.95 and has held at that level for two years.

Costs are falling

According to the update, operating and maintenance costs have continued to fall and appear to be trending to approximately one cent per kWh for large mature wind power stations. Installed costs for wind power stations have fallen dramatically and are now ranging from \$1200 to \$1900 per kW.

"In general," stated the report, "wind power stations using the smaller machines look very attractive as a future utility generation option."

Several trends in the industry were pointed out by the institute:

- Reliability has risen and costs are falling. The primary technical uncertainty remaining is long-term wear life of major components.
- Turbine prices have fallen sharply.
- Installed turbine ratings have risen from 50-kW to about 100-kW on the average.

Also, EPRI said leading developers now understand the benefits of centralized monitoring, control, and data acquisition which can be provided if their machines are deployed in more

fully integrated wind stations.

"Increased competitiveness," said the update, "along with changes in tax incentives, is causing a wind power industry consolidation from which a smaller industry composed of more stable and well-rounded players is likely to emerge."

Although small wind turbine technology is maturing, EPRI said the experimental multi-megawatt wind turbines continue to show poor reliability maturation and low availabilities, because of size, complexity and logistic requirements.

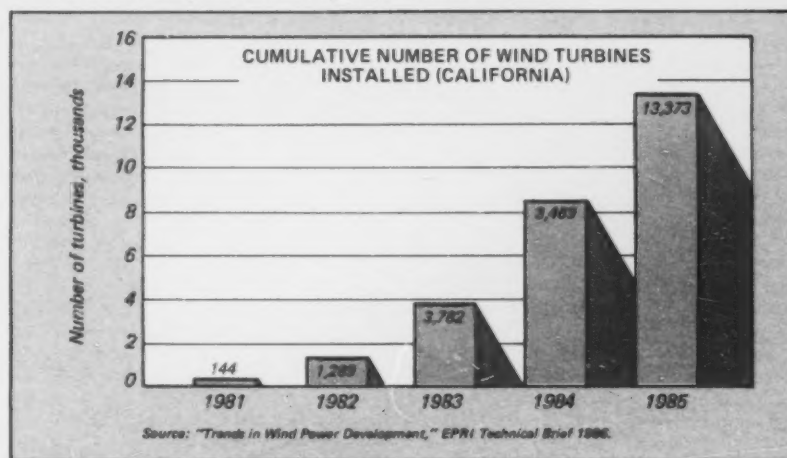
Noted the update, "Long downtimes associated with failures slowed maturation of the technology. Questions regarding practicality of use and size of market surfaced, which in turn made it doubtful that the production volumes upon which early cost estimates were based would ever be reached."

EPRI believes the majority of the

wind power industry feel that it is more cost-effective to evolve wind technology from the bottom up.

"In other words," notes the report,

"the small machine technology can be pushed up to larger sizes rather than trying to streamline the multi-megawatt machines."



THE CLEAREST, MOST SOPHISTICATED MACHINE MONITORING SYSTEM IN MEMORY.



Biofouling ... from page 15

stream pipe elbow.

□ *Movable Diffuser Manifold.* The moveable manifold concept shown in figure 1B is more complicated to operate and maintain than a fixed-nozzle system. However, the manifold operates independently of water-box flow patterns. This eliminates the need for site-specific studies. Also, it uses less chlorine and, by lowering flow velocity in the tubes, provides more chlorine contact time than fixed nozzles.

The study concluded that both the fixed-nozzle system enhanced by upstream guide vanes and the movable diffuser manifold offer potentially feasible options for targeted chlorination. The Tennessee Valley Authority (TVA) has successfully demonstrated the manifold diffuser concept at its Kingston station. EPRI will demonstrate the fixed nozzle technique in full-scale testing this year at Unit 1 of New England Electric System's Brayton Point station.

Data from a second TVA guild study on movable manifolds, conducted at Unit 1 of the John Sevier power plant, now is being evaluated by EPRI. Future work includes testing to better define optimum chlorination dosage, concentration and frequency.

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